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EASTERN—WESTERN  
ARCTIC SEA ICE ANALYSIS  
1980

PREPARED BY  
NAVAL POLAR OCEANOGRAPHY CENTER,  
SUITLAND, MD

PREPARED FOR  
COMMANDER,  
NAVAL OCEANOGRAPHY COMMAND  
NSTL STATION, BAY ST. LOUIS, MS 39529



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## FOREWORD

The U.S. Navy has a long and colorful history of polar exploration and currently is an active participant in the growing national activity in the Arctic and Antarctic. The strategic importance and increased demand for the natural resources of these areas have resulted in a greater requirement for environmental information. In 1976, the National Oceanic and Atmospheric Administration (NOAA) joined the Navy in forming a Joint Ice Center (JIC) to combine efforts and resources in sea ice analysis and forecasting.

Through 1972, reliable sea ice information in the polar regions was based on a relatively few shore station and ship reports augmented by limited aerial reconnaissance data. These data were further restricted mainly to the relatively small areas observed primarily during the ship operating seasons. The advent of high resolution satellite imagery combined with the ground truth of conventional observations has in recent years enabled a description of the polar ice fields on a semi-synoptic scale in both polar regions.

This publication is the seventh in a continuing yearly series of Arctic sea ice atlases prepared in the Joint Ice Center at the Naval Polar Oceanography Center, Suislaw. The atlas contains weekly charts depicting Northern Hemisphere and Great Lakes ice conditions and extents. The information presented was prepared under operational time constraints principally from satellite imagery supplemented by conventional observations. The Great Lakes ice analyses are derived principally from information provided by the National Weather Service Forecast Office, Ann Arbor, Michigan. Table I located on the inside back cover summarizes satellite data availability for 1980.

Commencing with tenths of ice cover earlier, were identified.

The purpose of weekly hemispheric involved in manually analysis procedures:

a. Conventional plotted on base chart

b. Satellite data and highest resolution yields the final analysis

c. Where su estimated ice boundary edge position is based. During subsequent weeks positions.

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g with the first analysis of 1980, ice concentrations are identified in coverage. Ice concentrations in analyses of prior years, 1979 and identified in oktas or eighths coverage.

e of this atlas is to provide operators and researchers with reliable eric ice analyses. Satellite data limitations and other difficulties ually synthesizing various forms of ice data have evolved the following res:

ntional shore station, ship and aerial ice reconnaissance observations are charts and evaluated for timeliness.

ite data is analyzed for ice information content, with the most recent olution considered first. Synthesis of conventional with satellite data analysis.

e sufficient data is not available to define the sea ice limit, an oundary is depicted. After one week of no data availability the ice based on analyzed theoretical ice drift data and other diagnostic aids. t weeks of no data availability the ice edges approach seasonal mean

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Navy Department  
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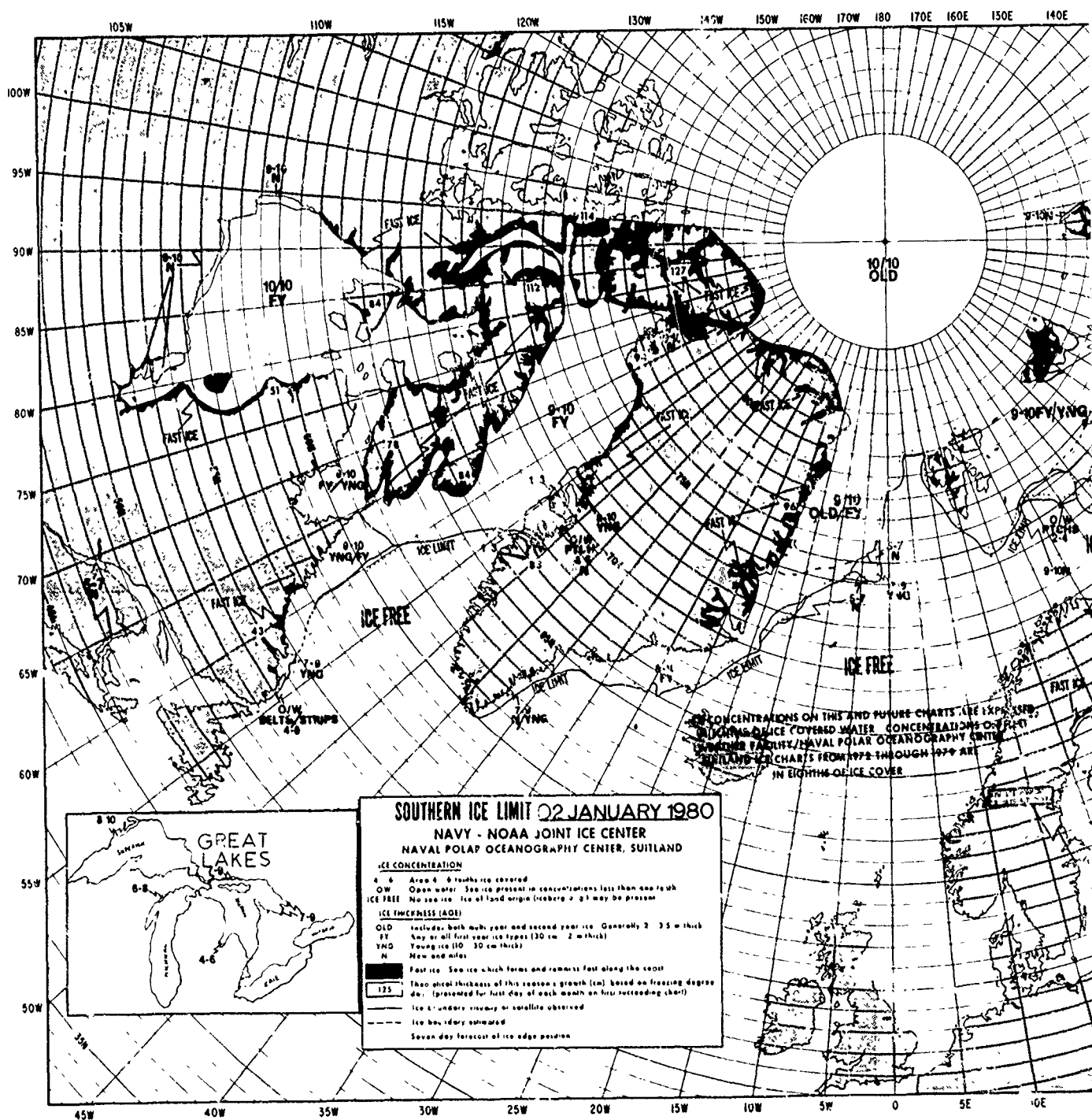
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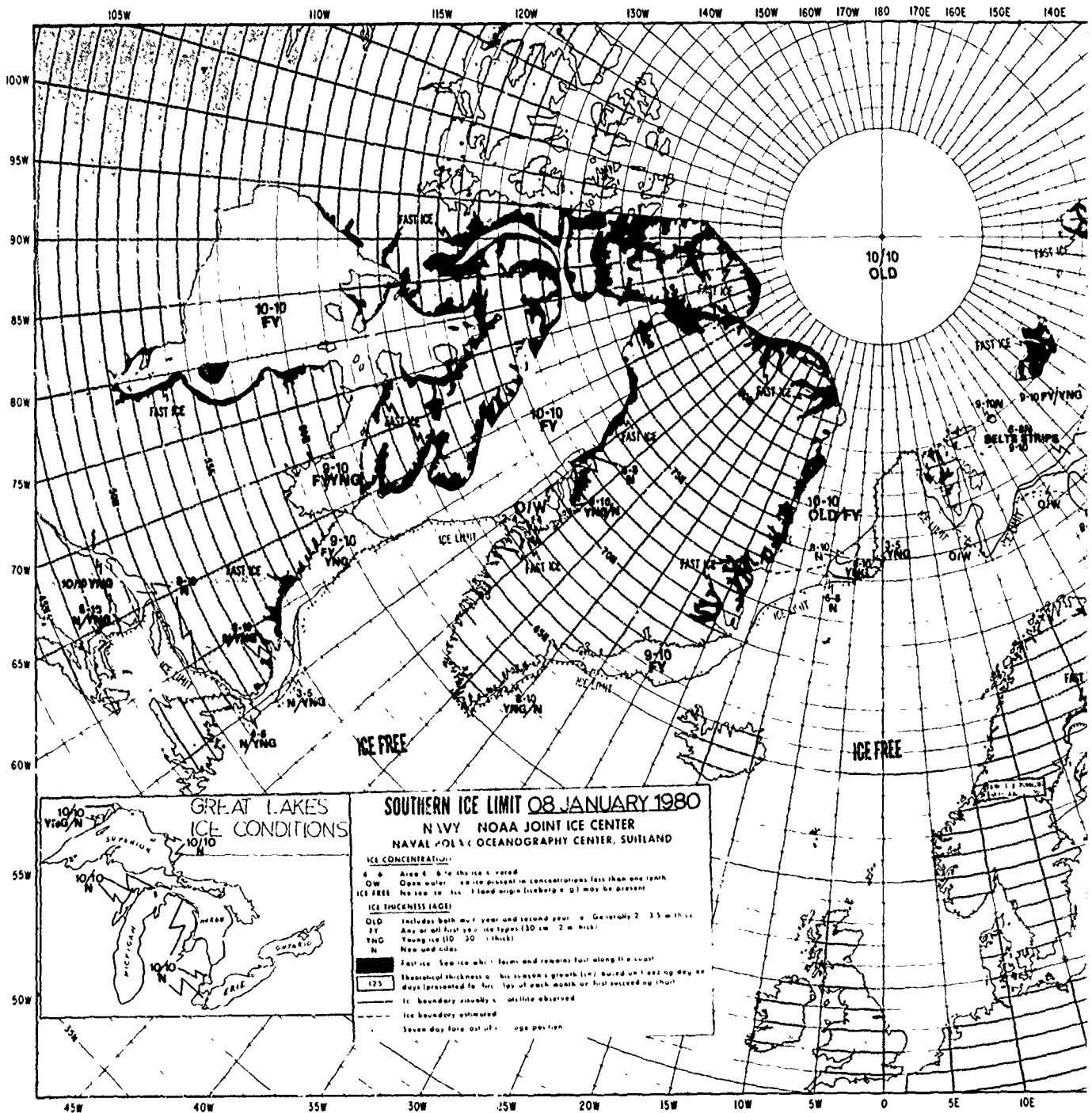
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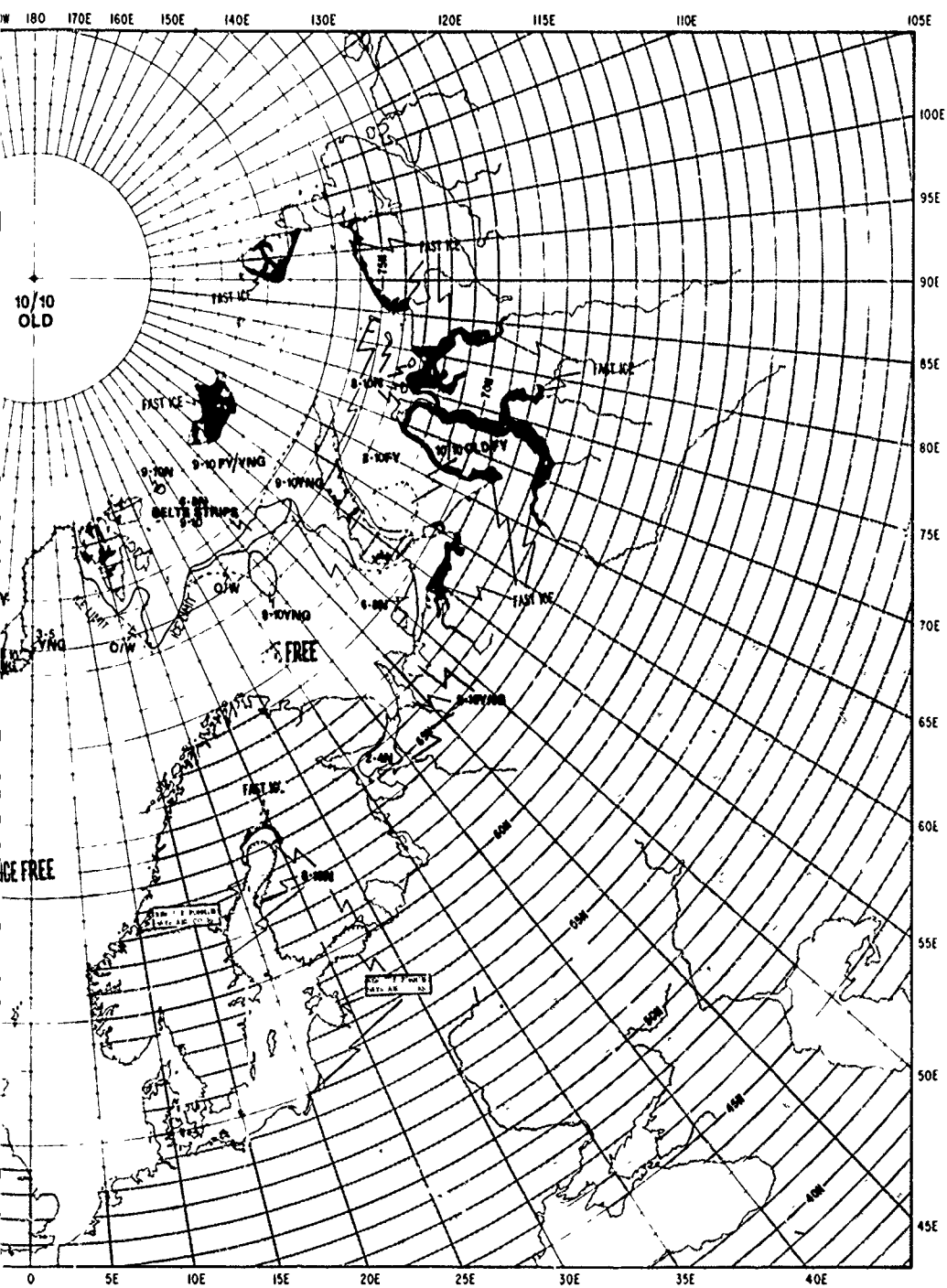
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This publication contains the separate weekly analysis charts of sea ice in the Eastern and Western Arctic Basins for 1980. Ice free, Southern limits, types and concentrations of sea ice are depicted. Ice analysis of the Great Lakes region are included for periods of ice occurrence.		

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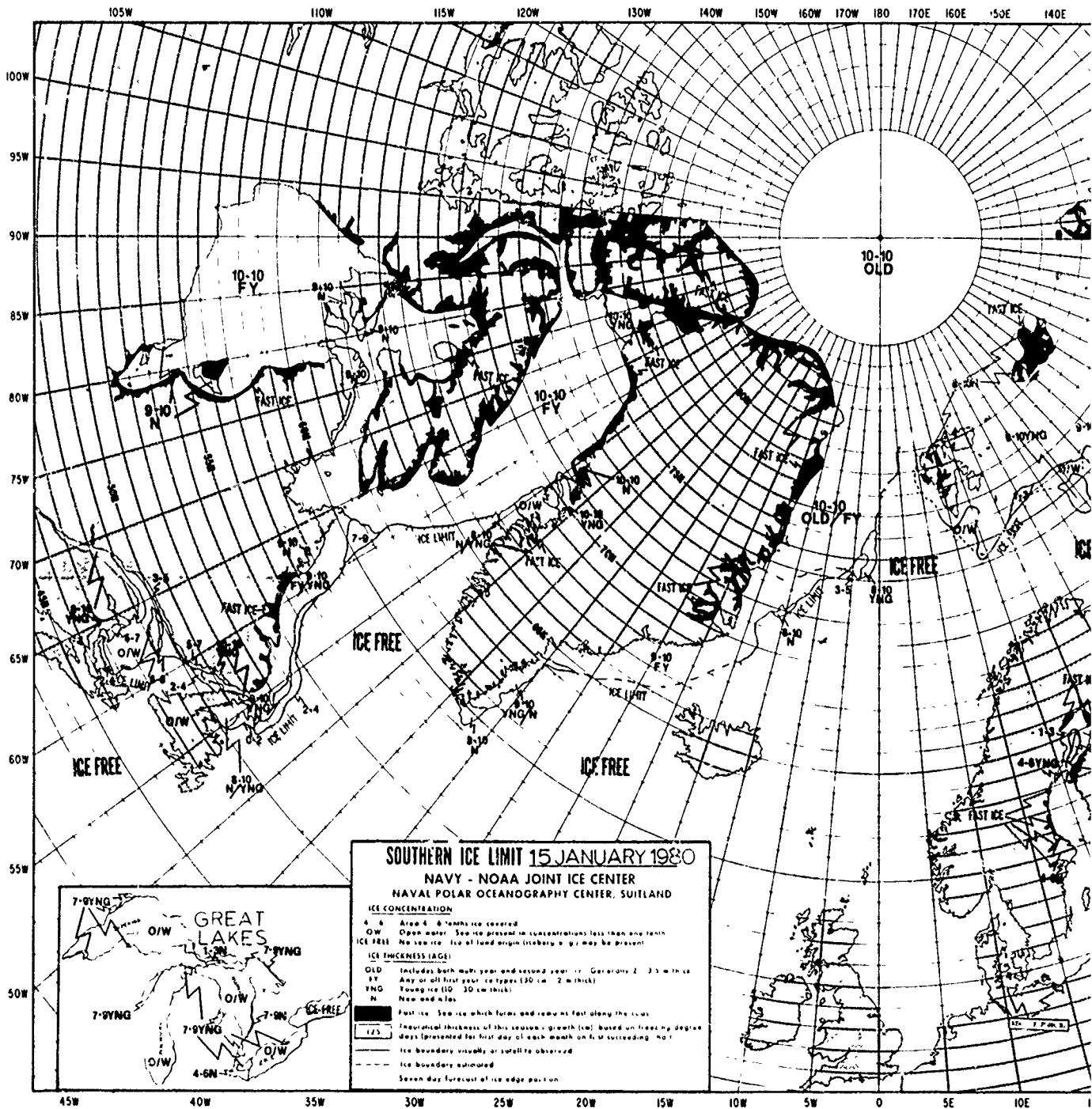






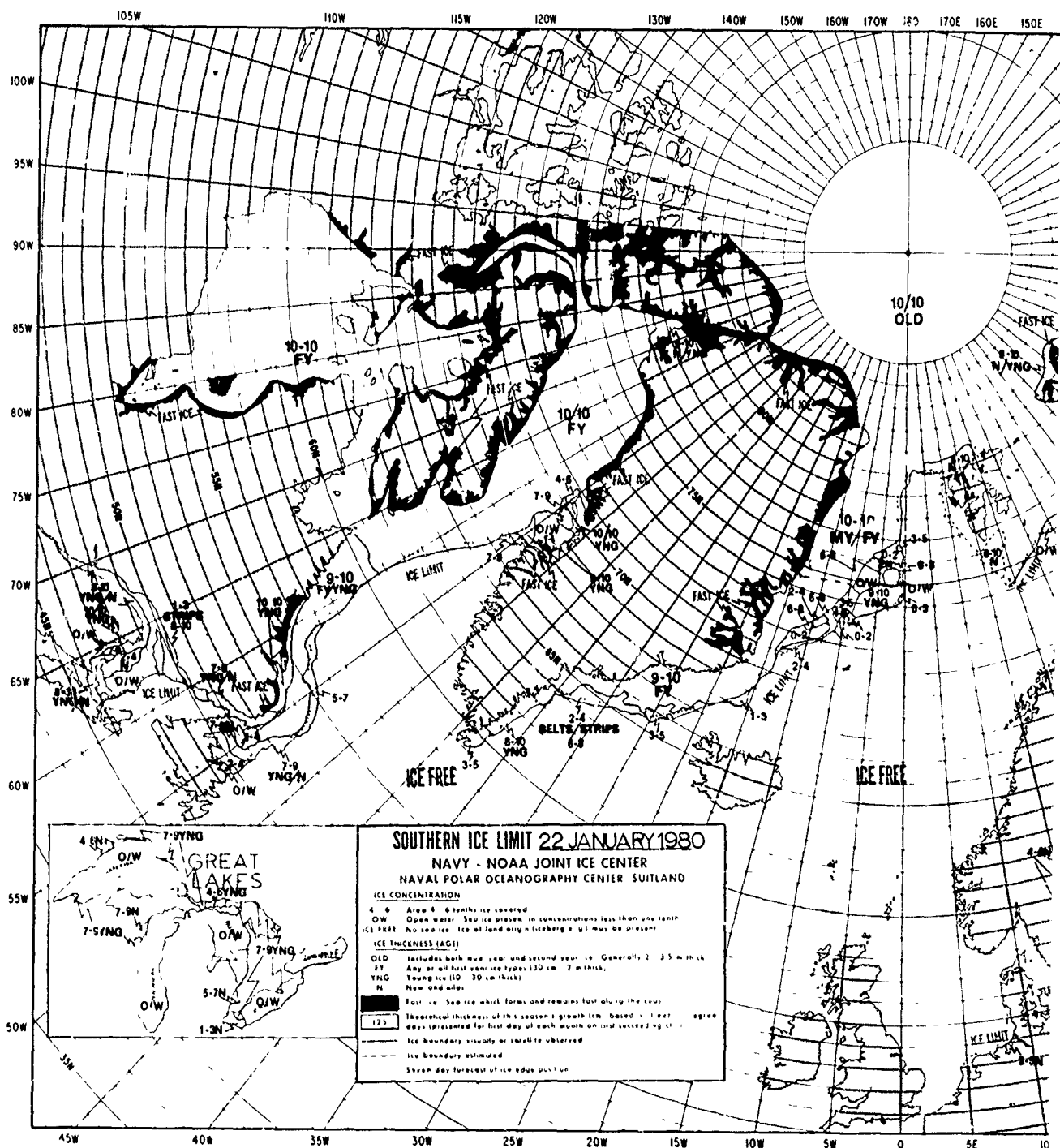


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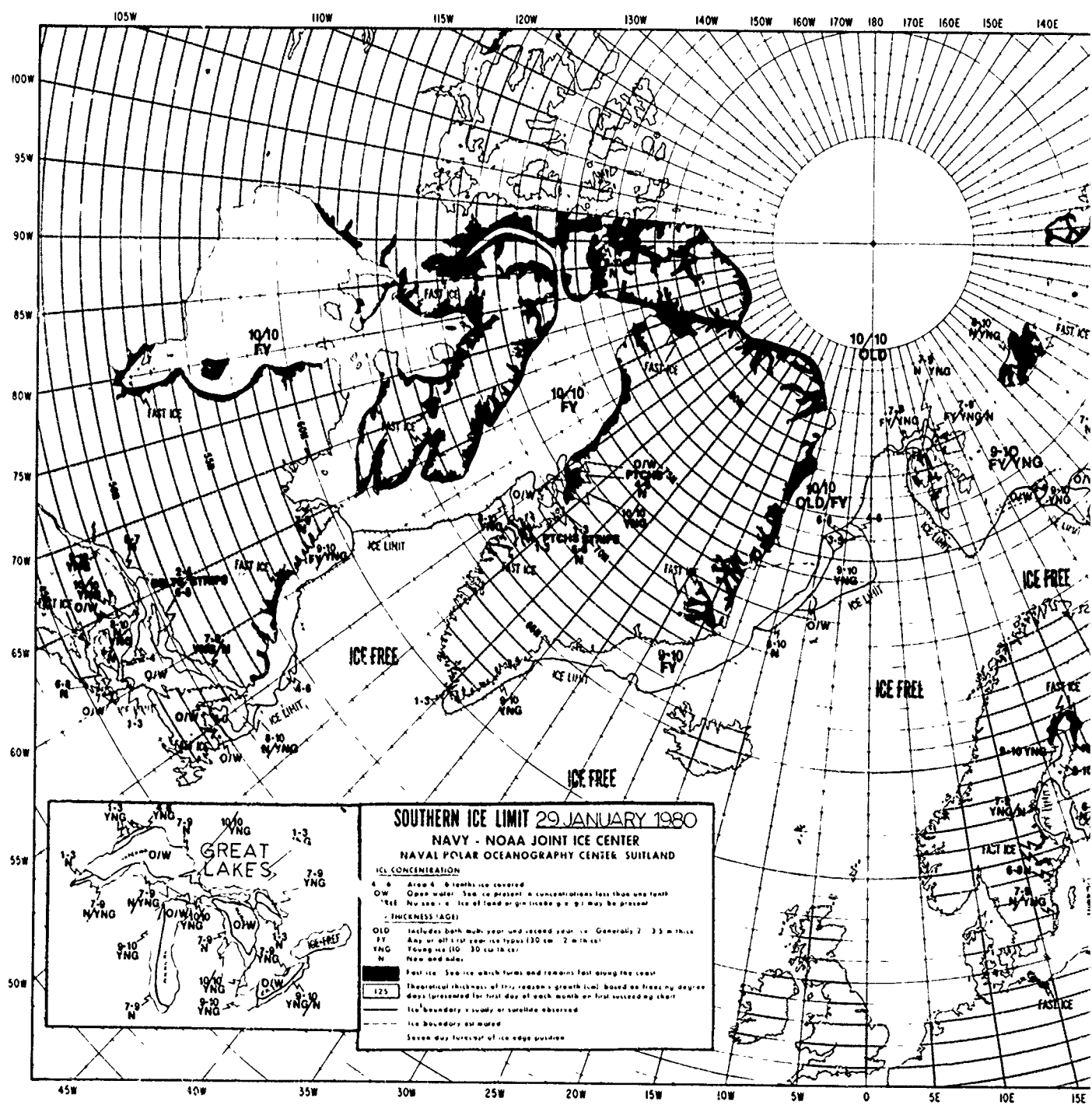


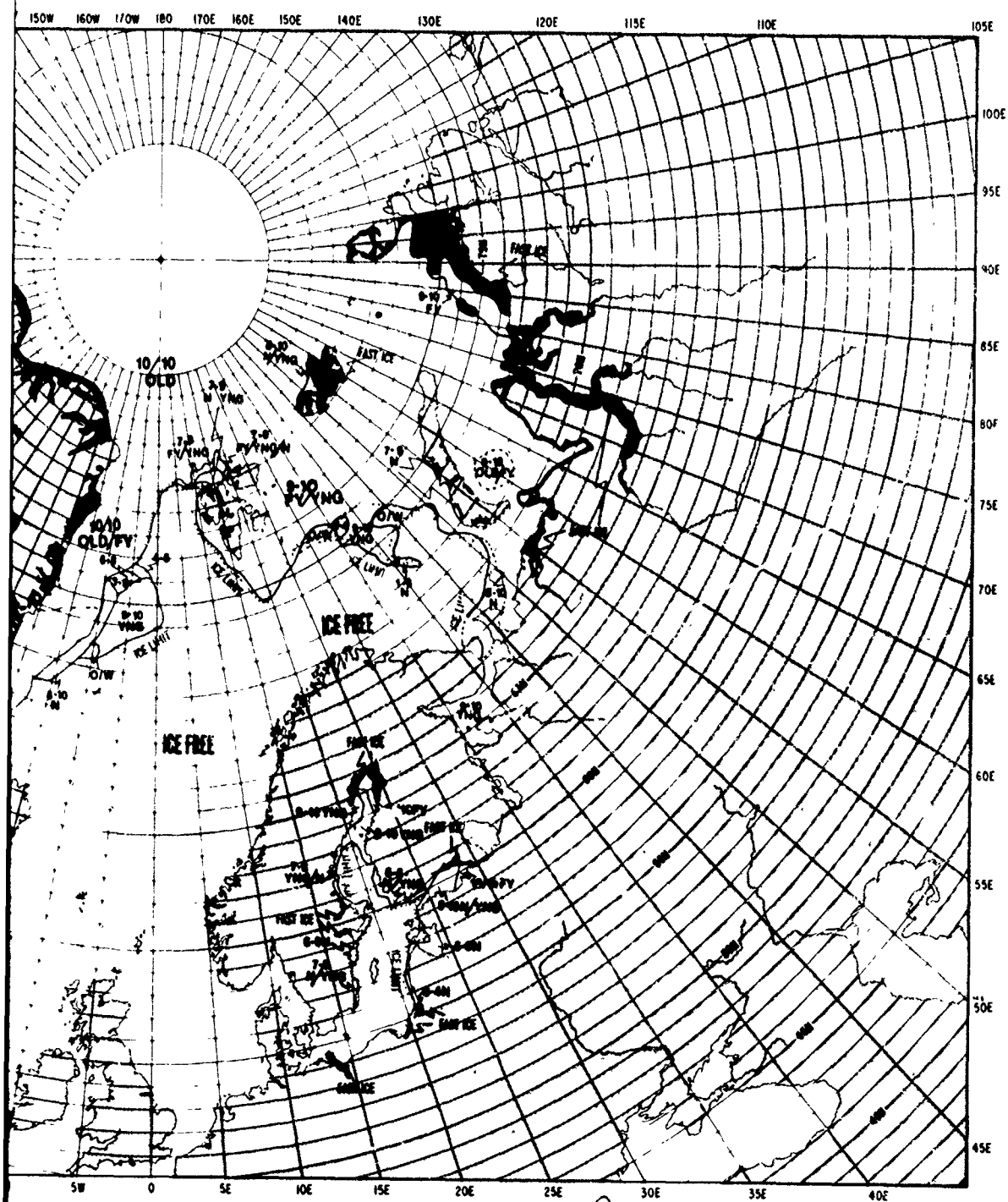


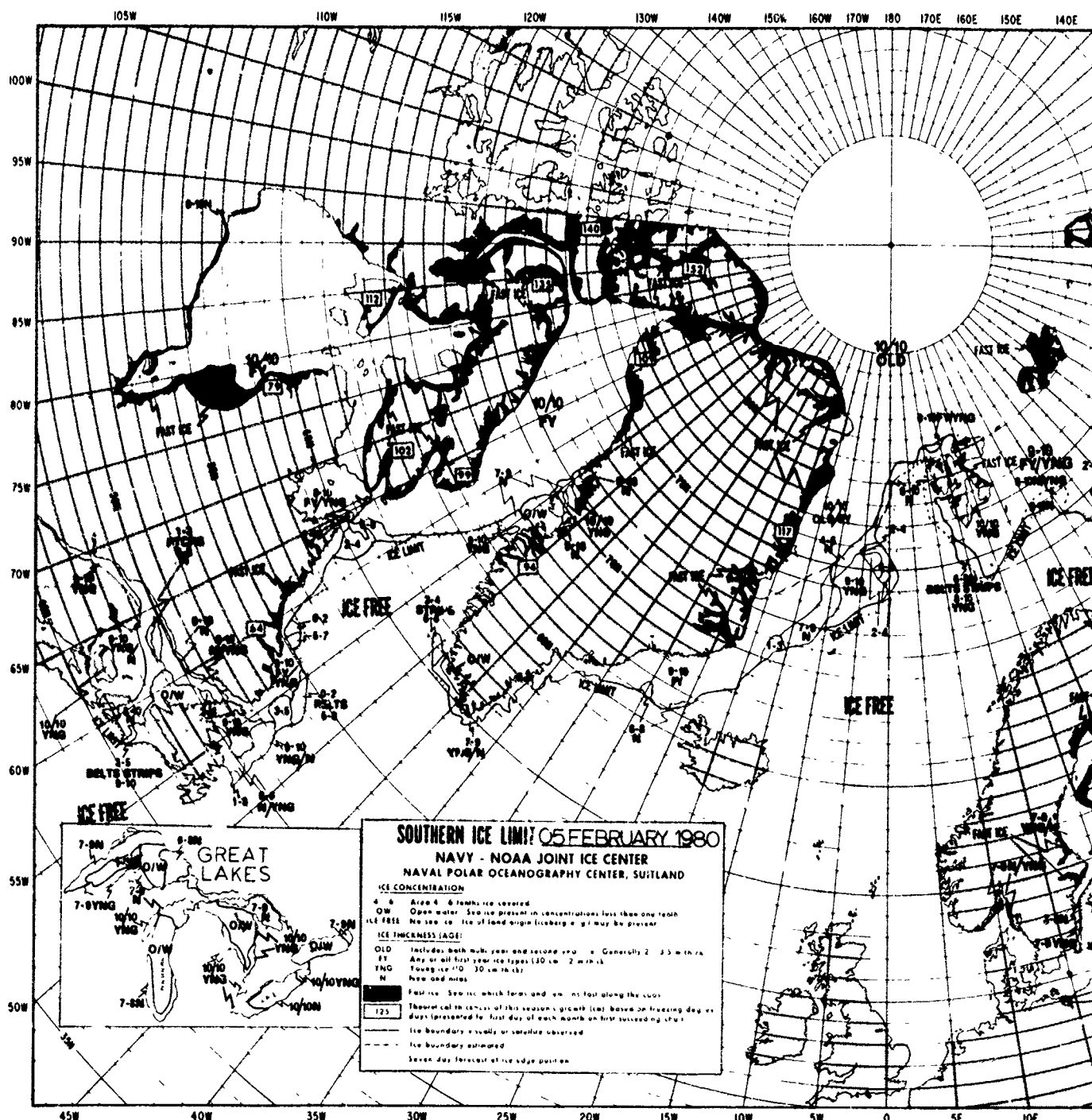


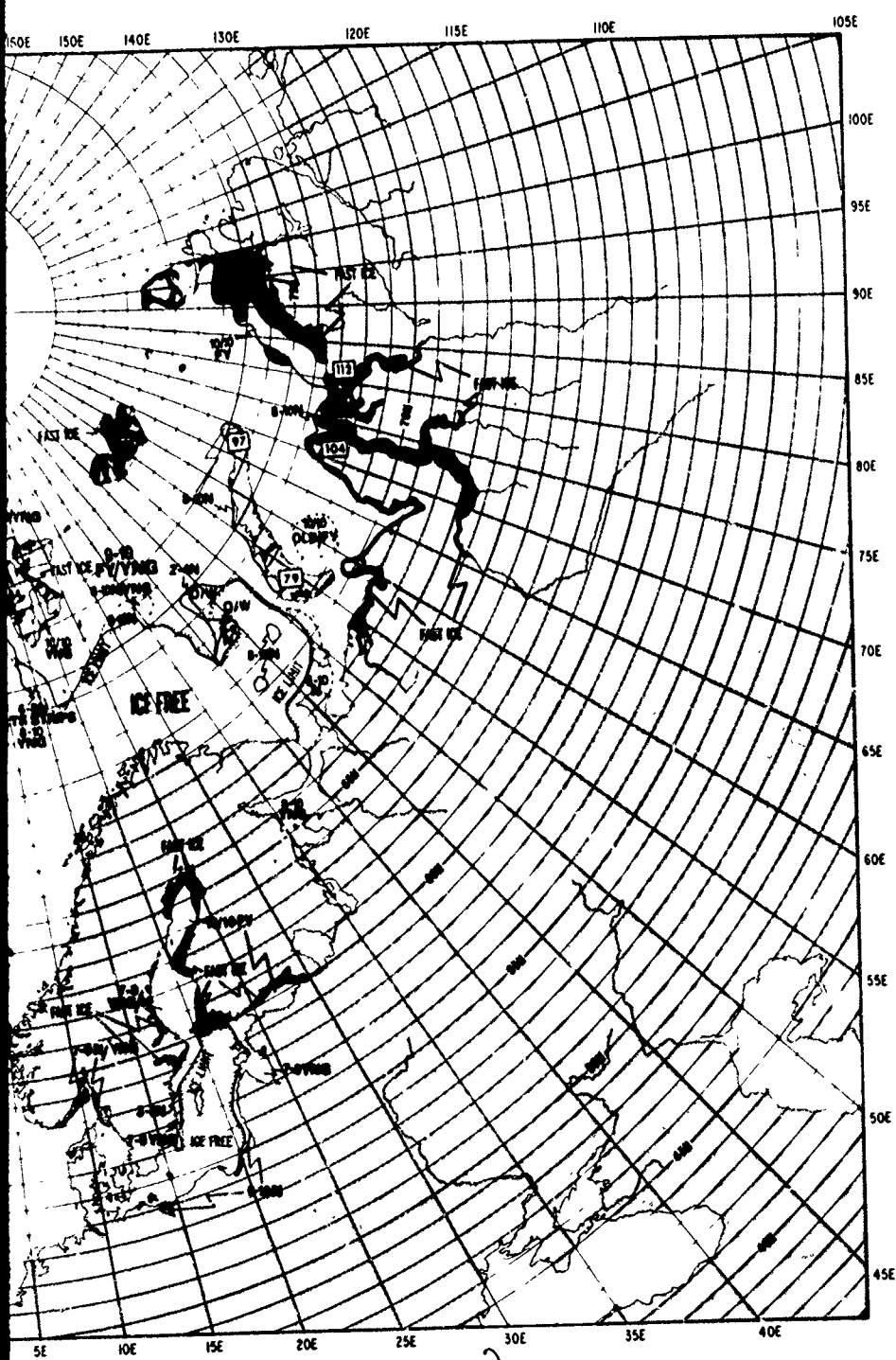


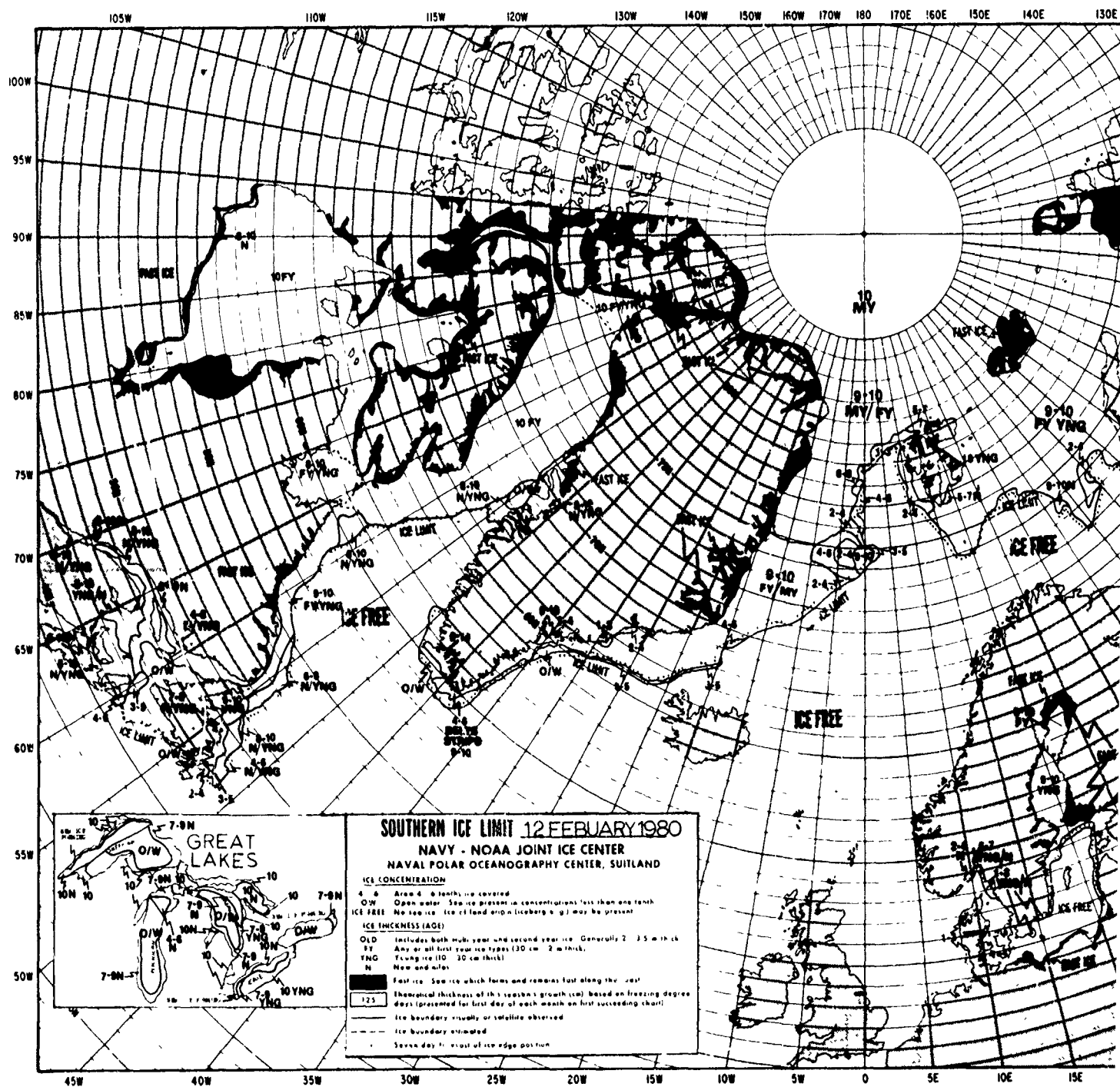


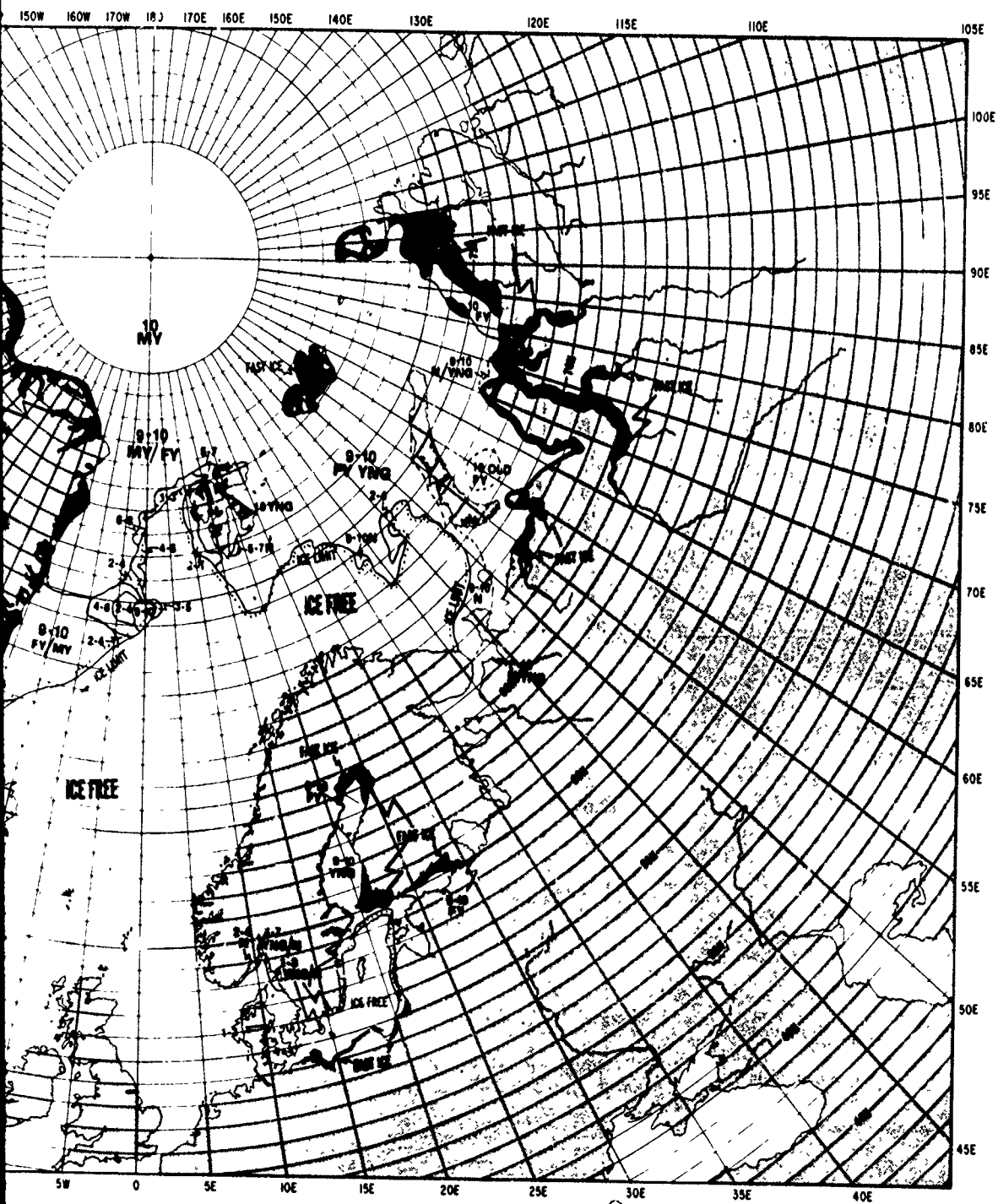




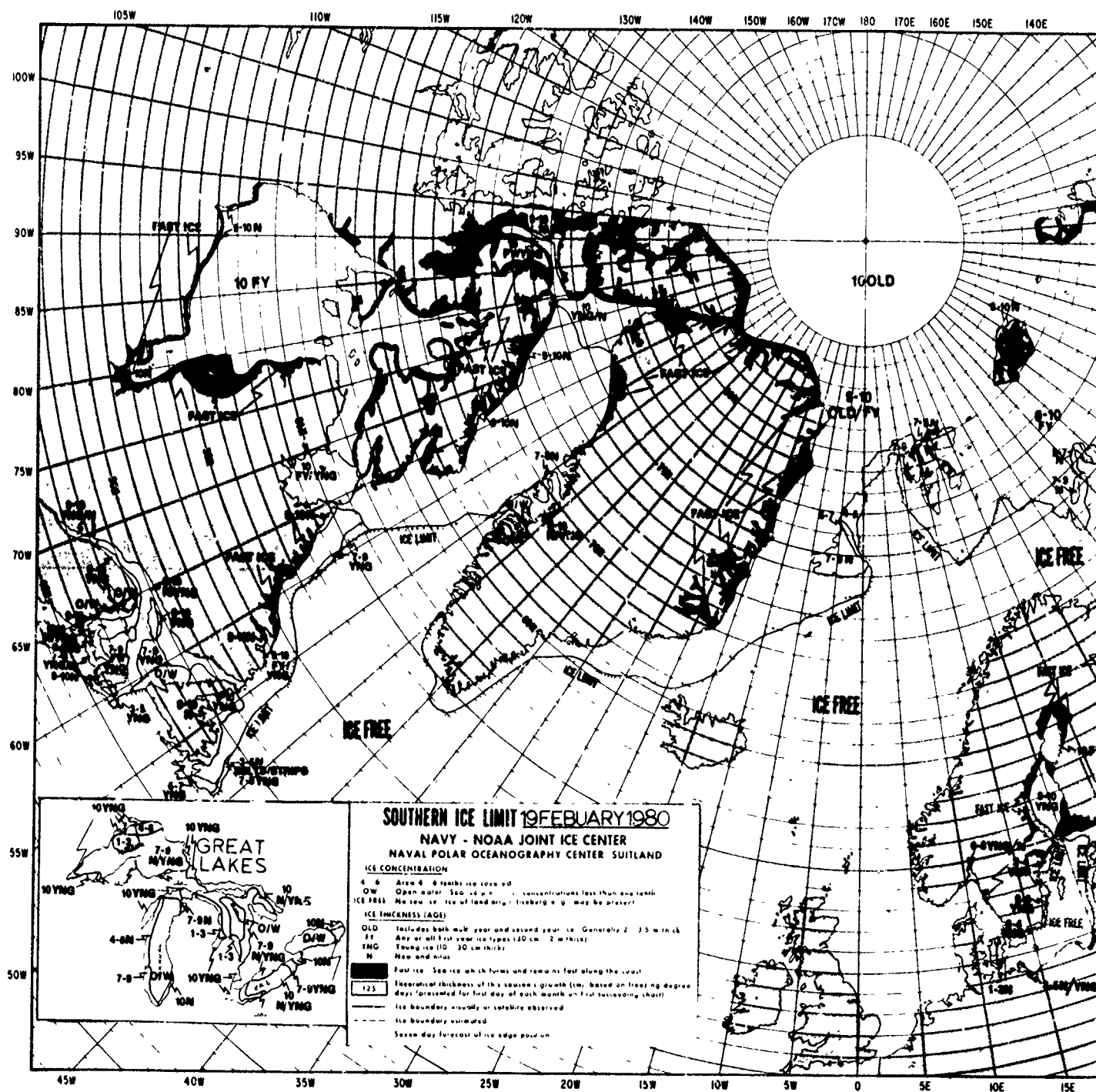


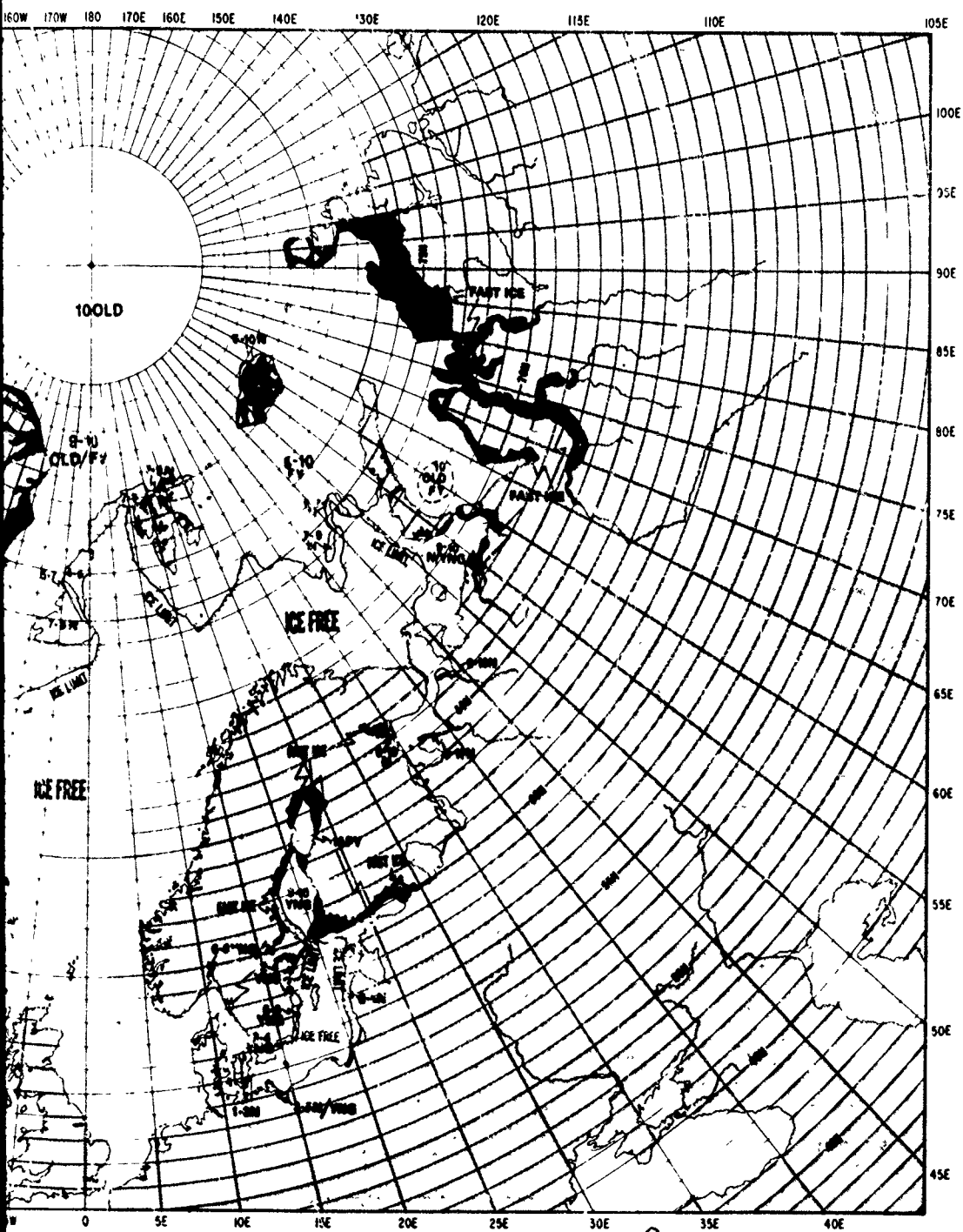


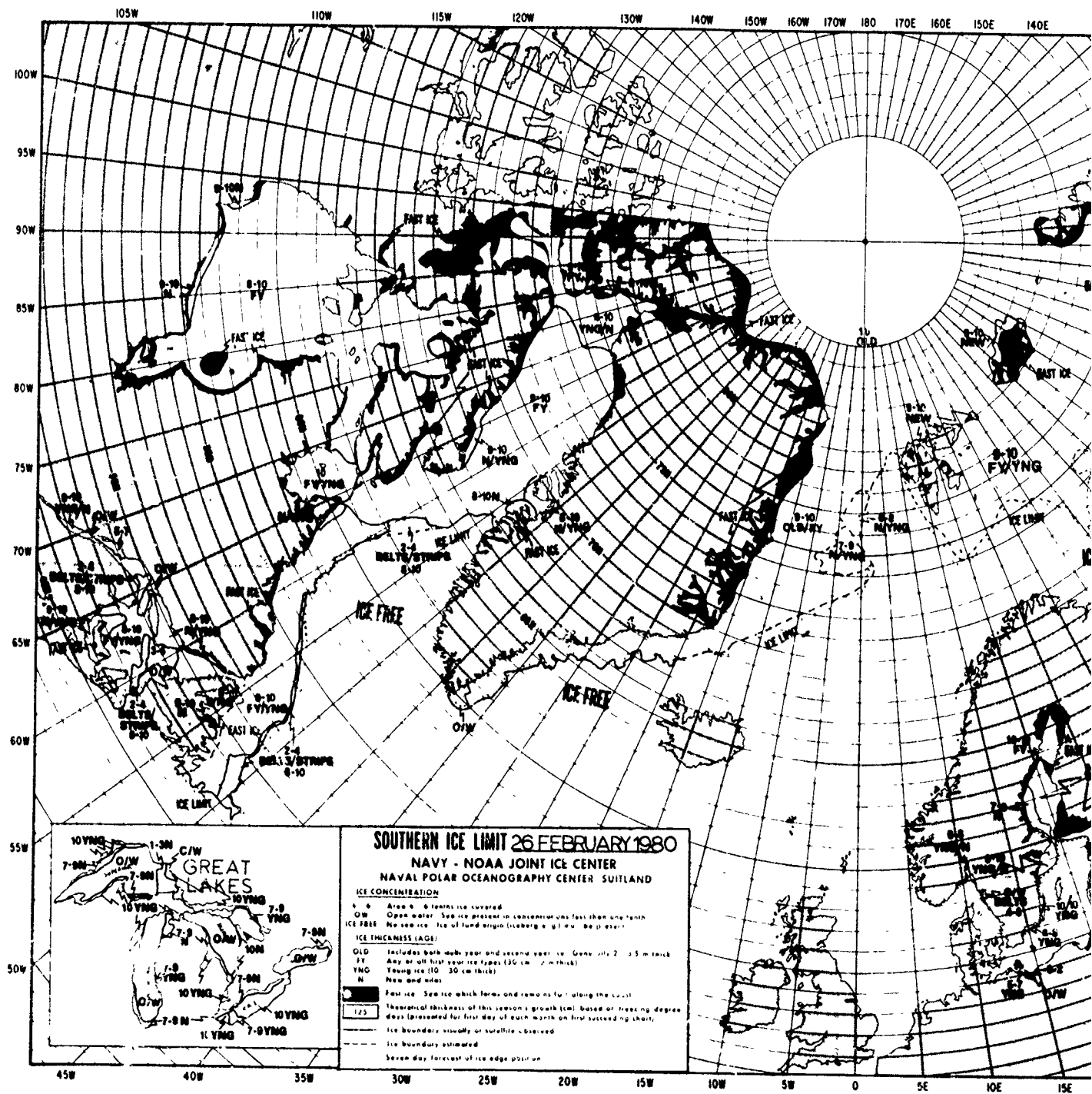


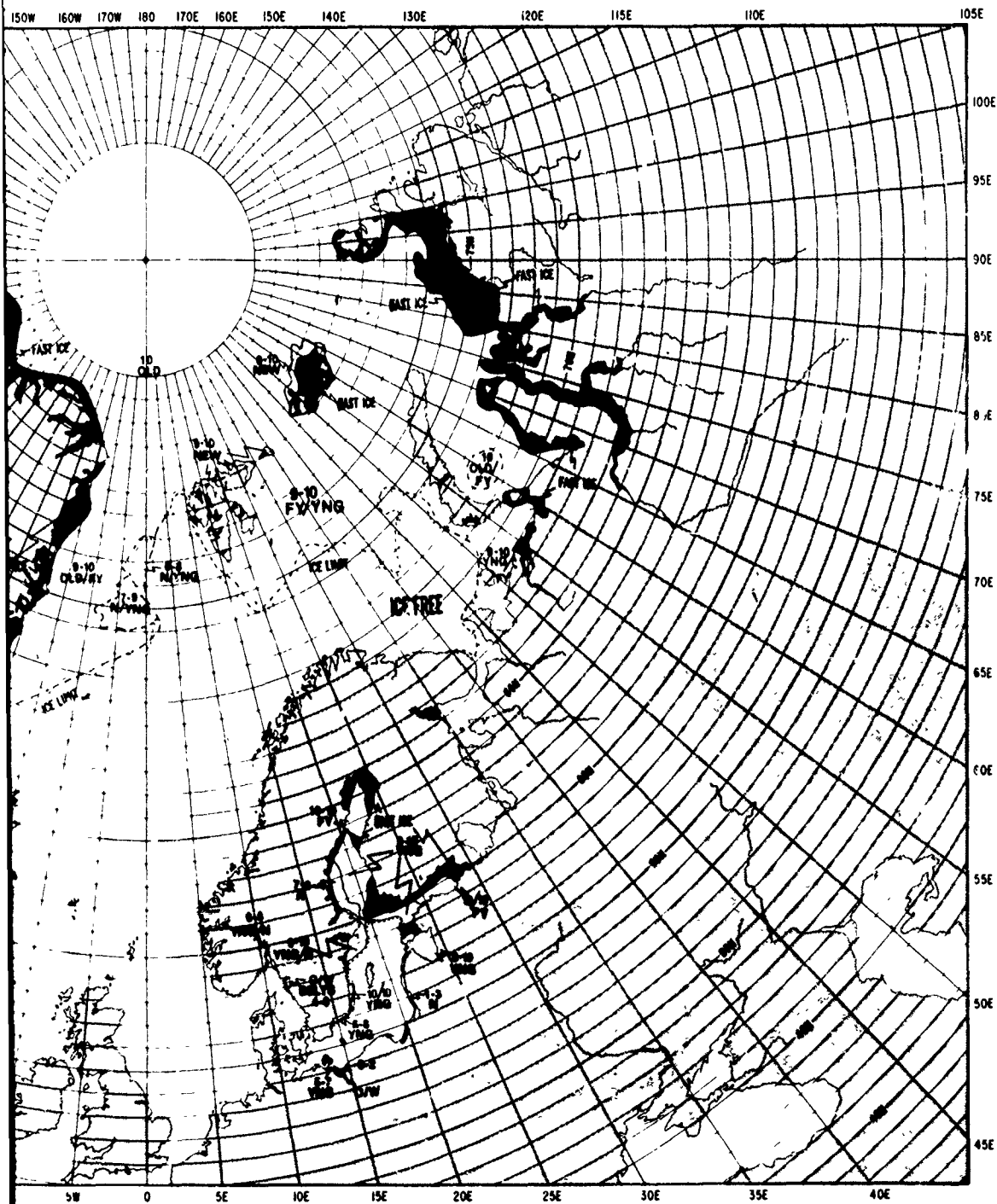


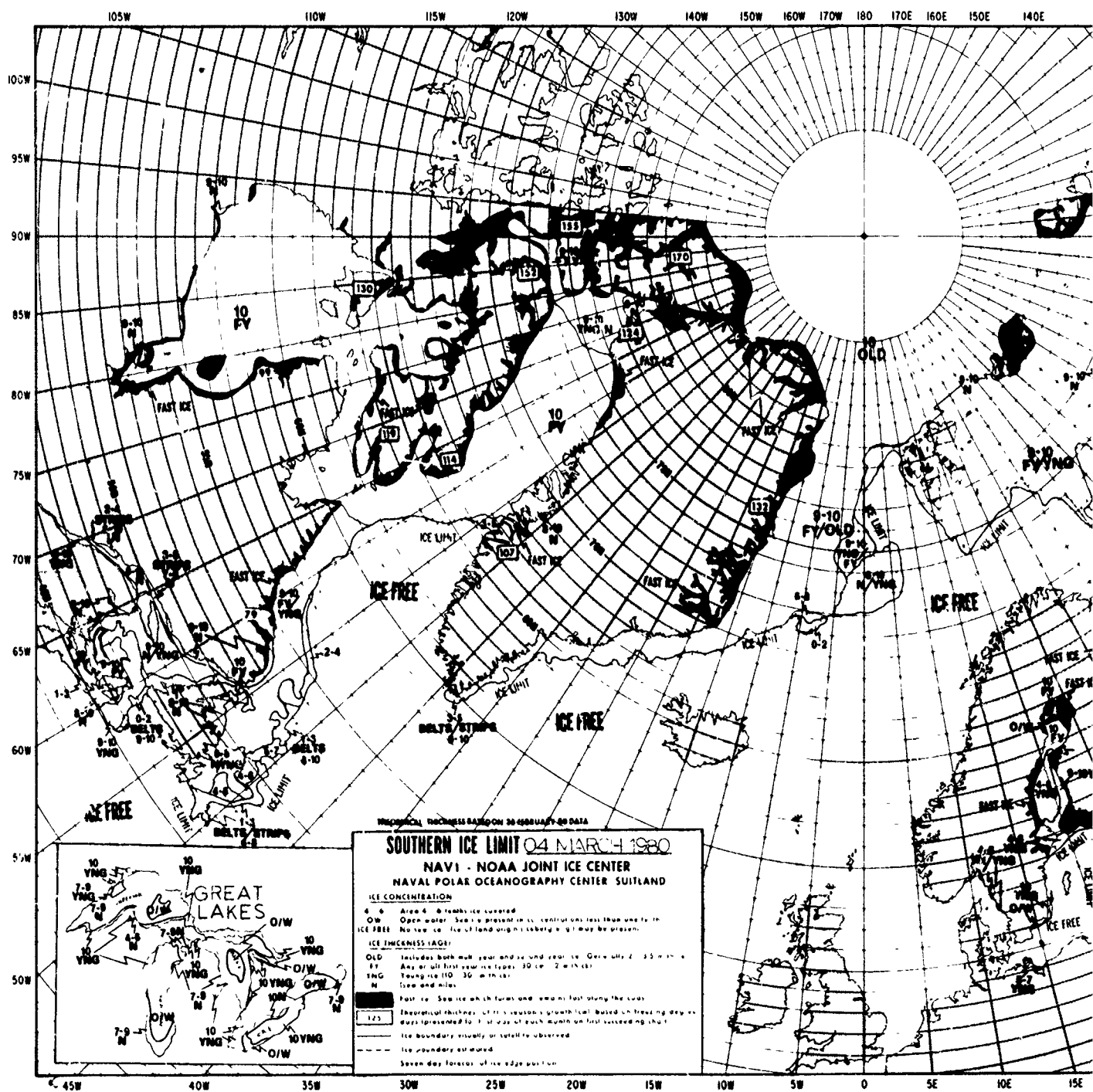


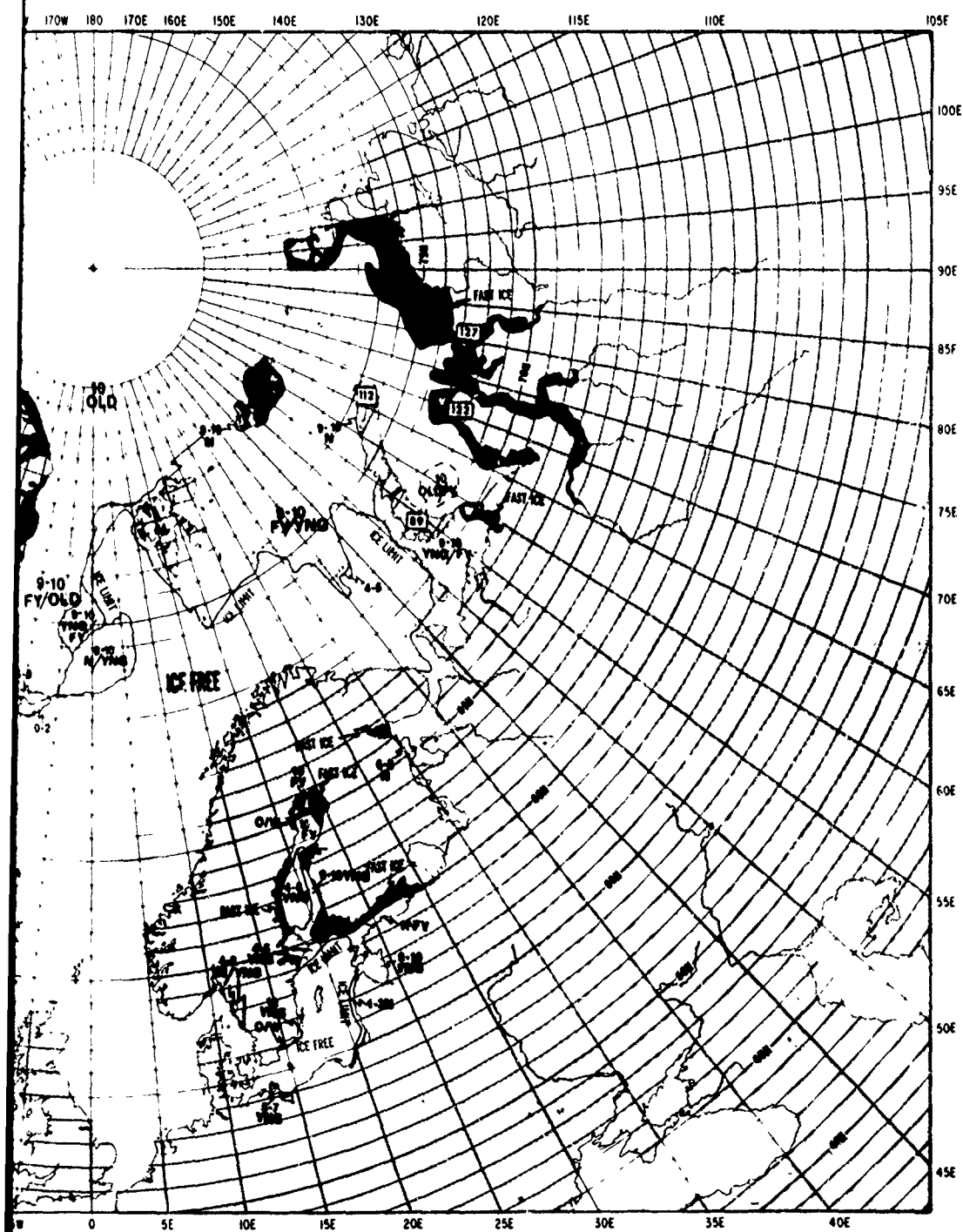




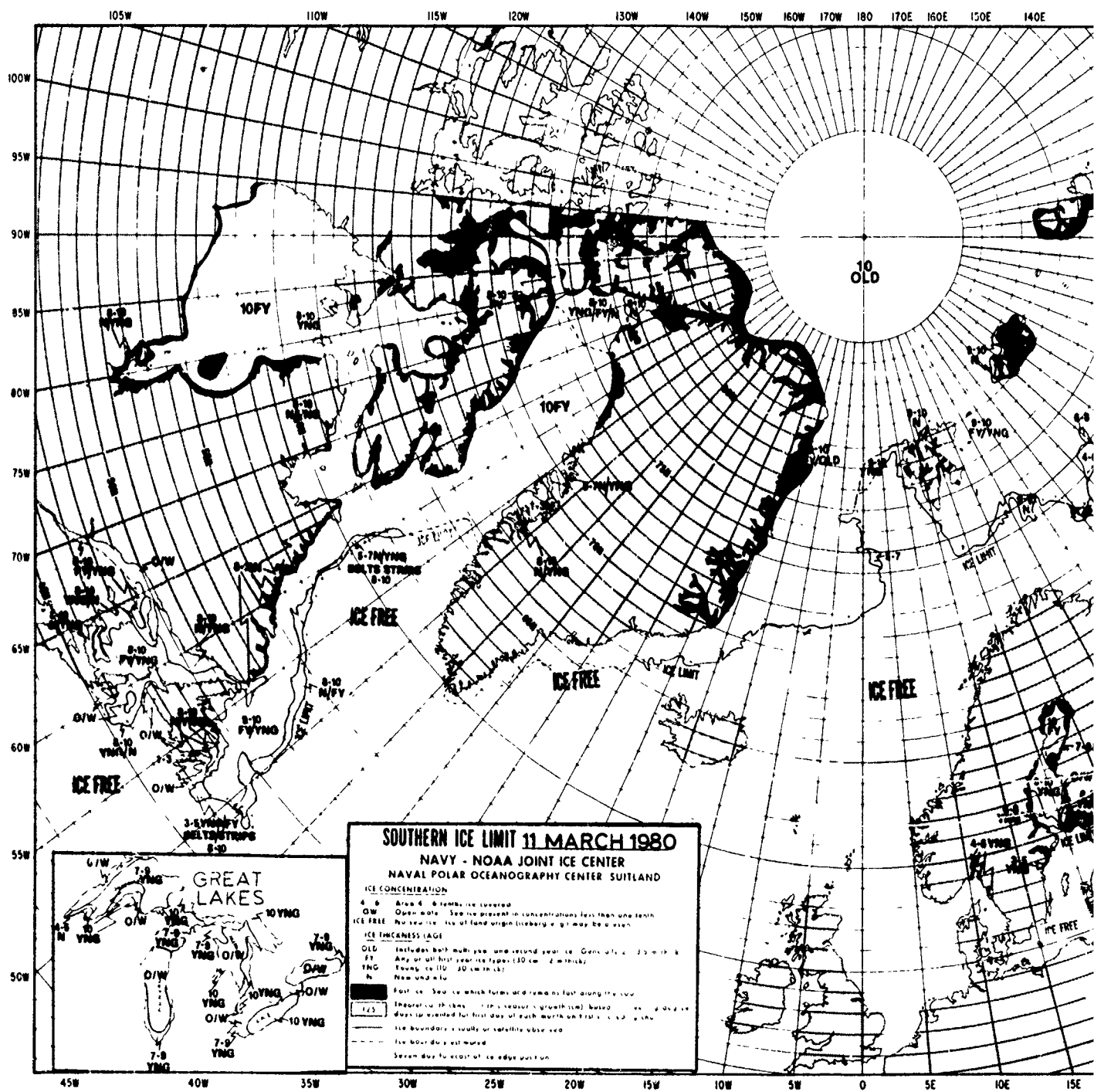


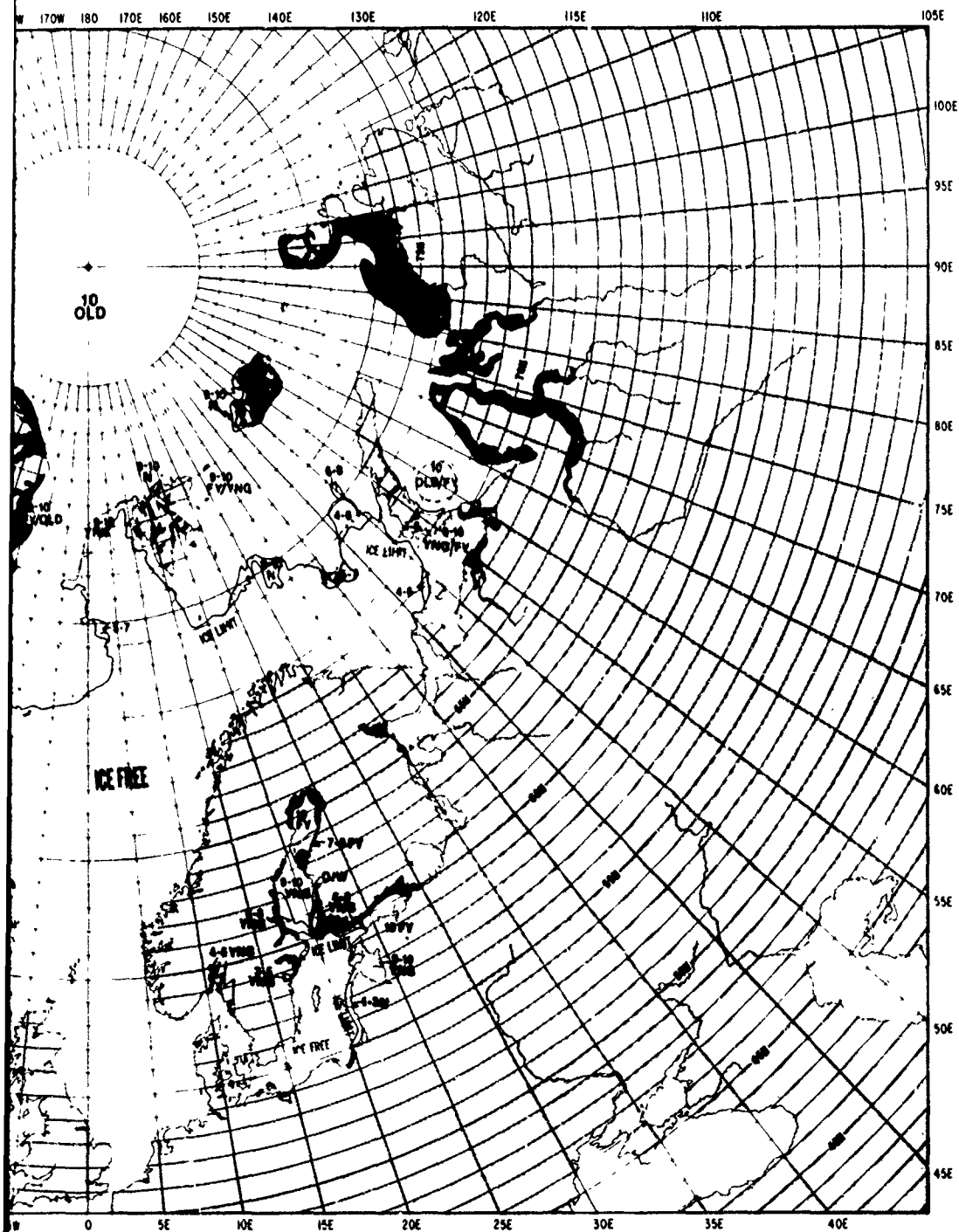




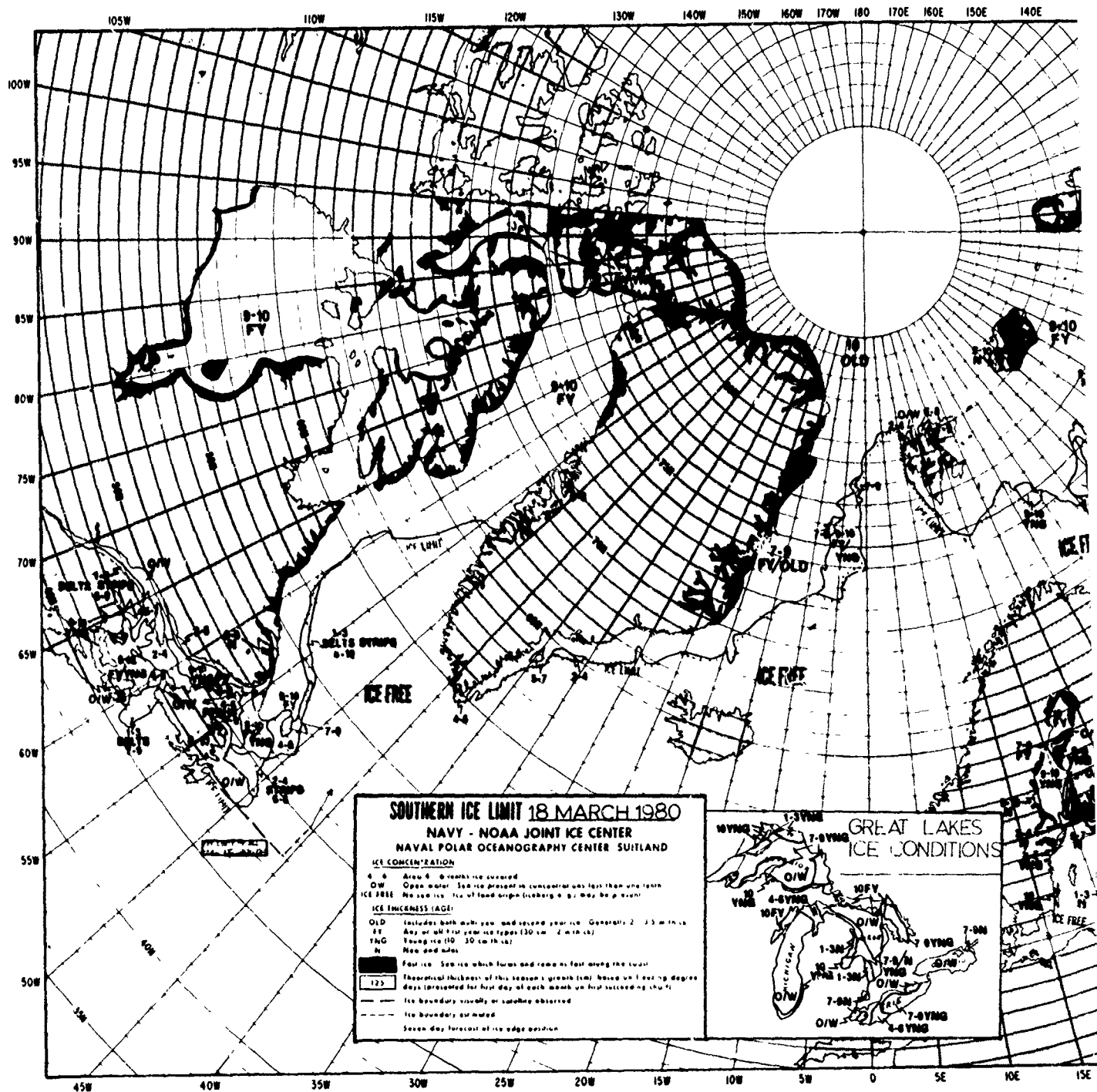


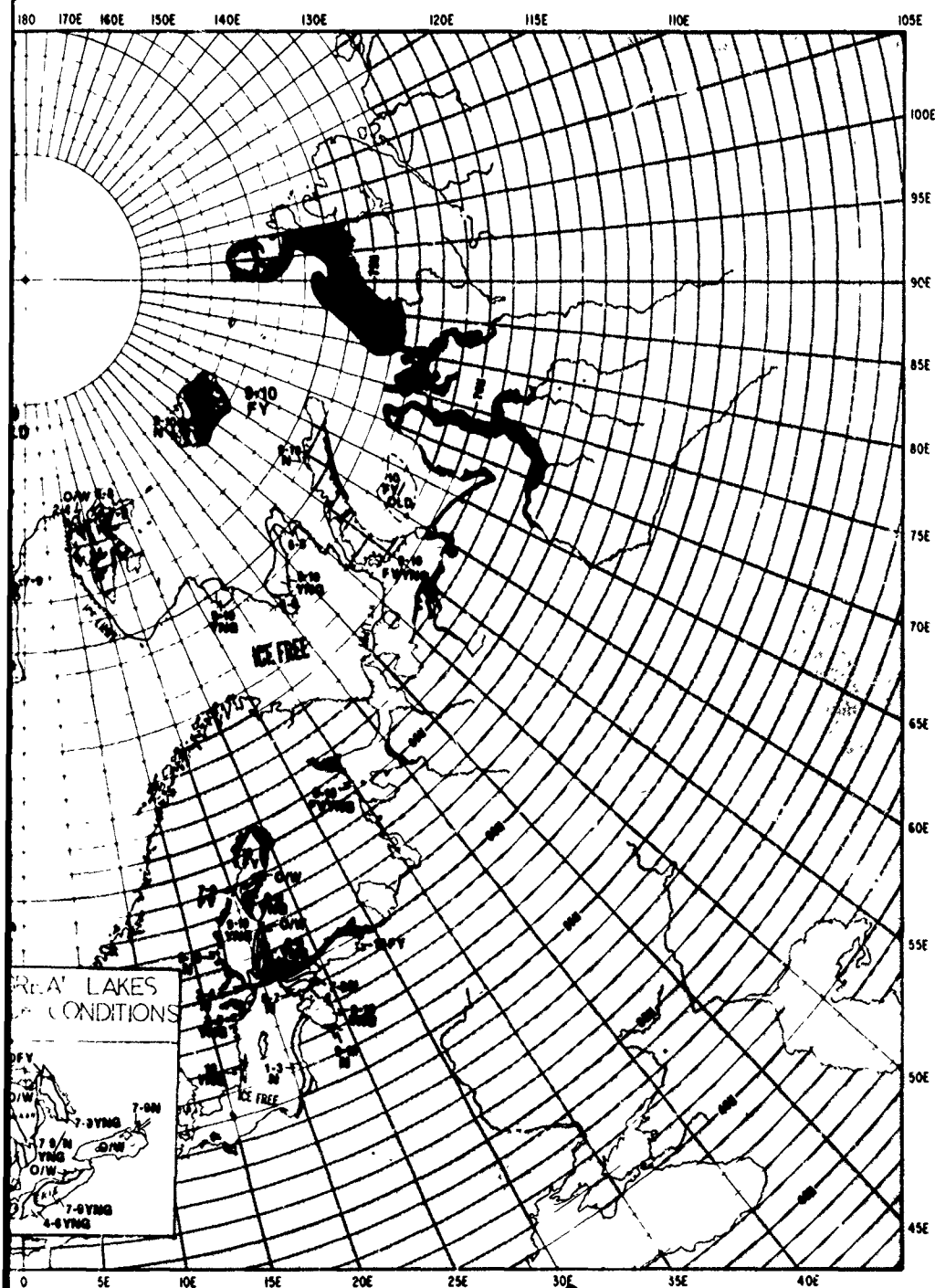
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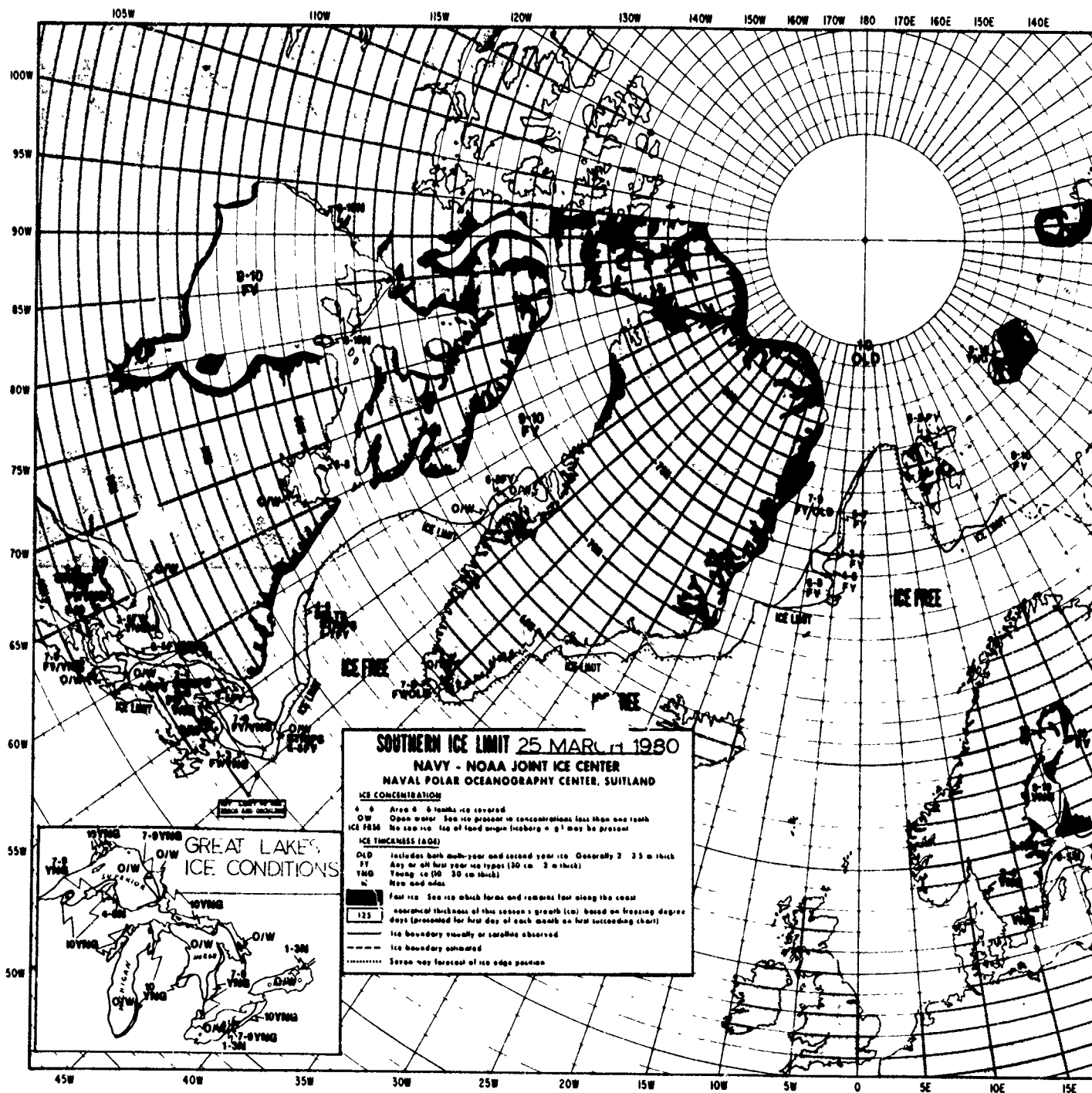


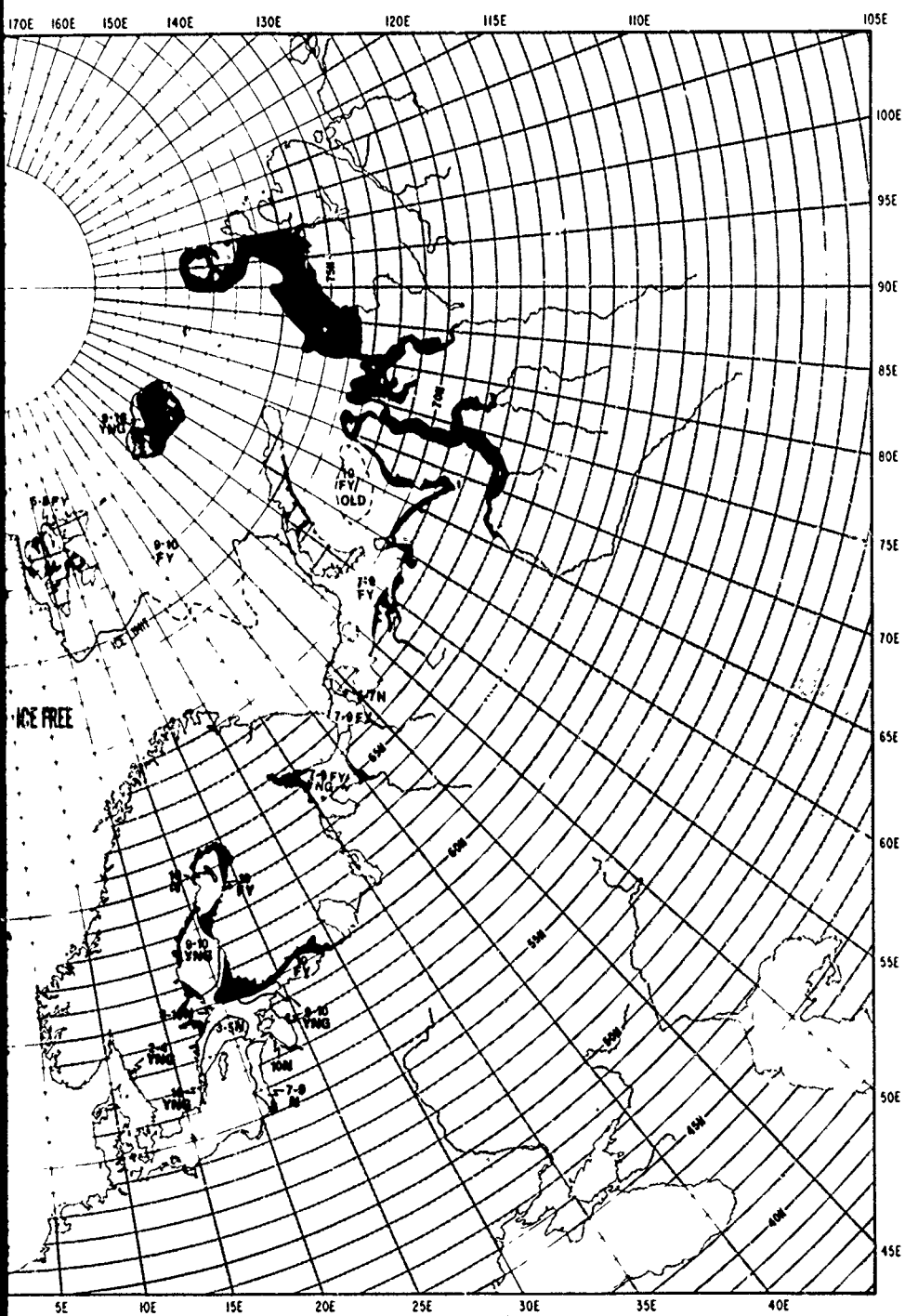




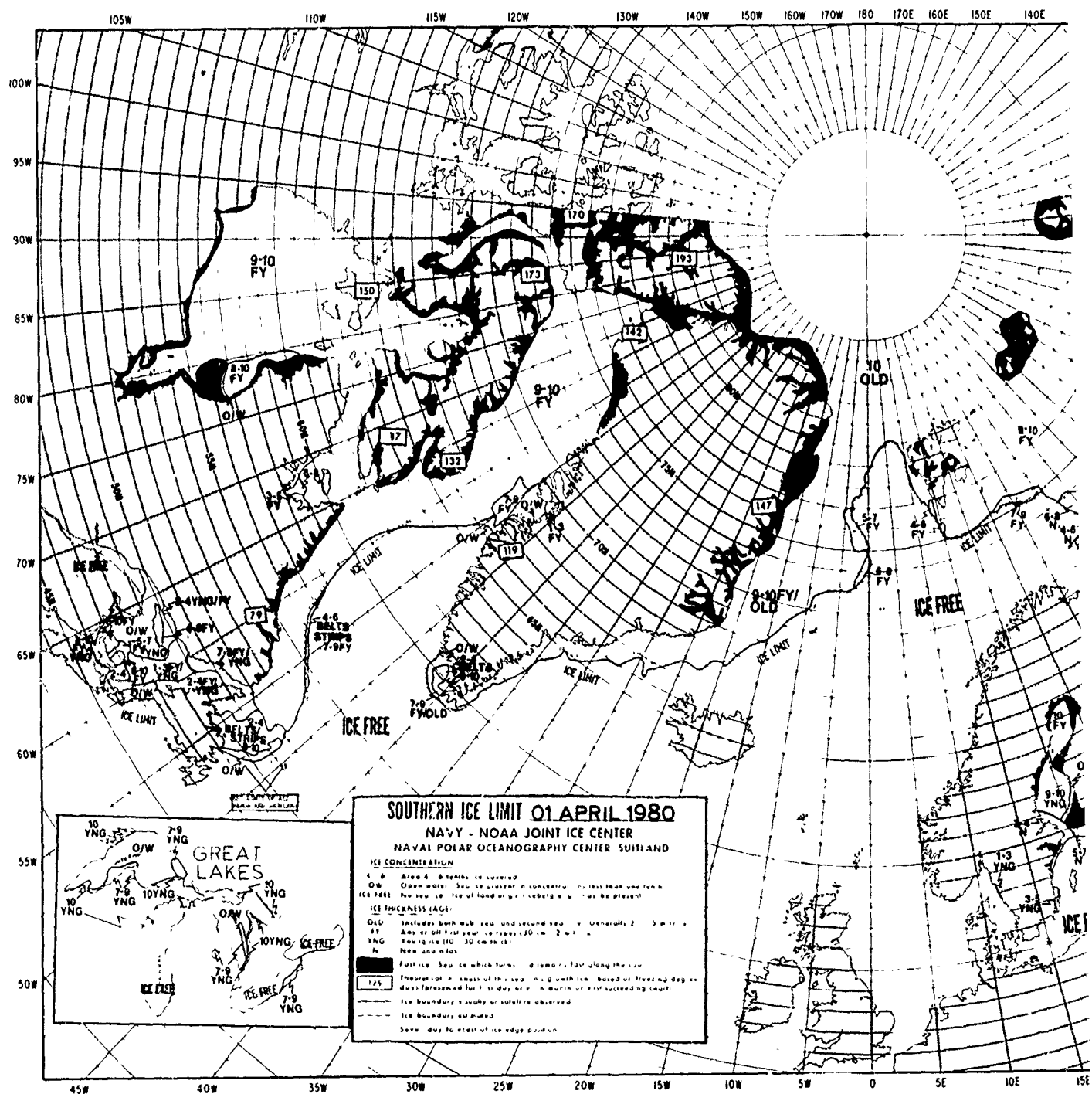


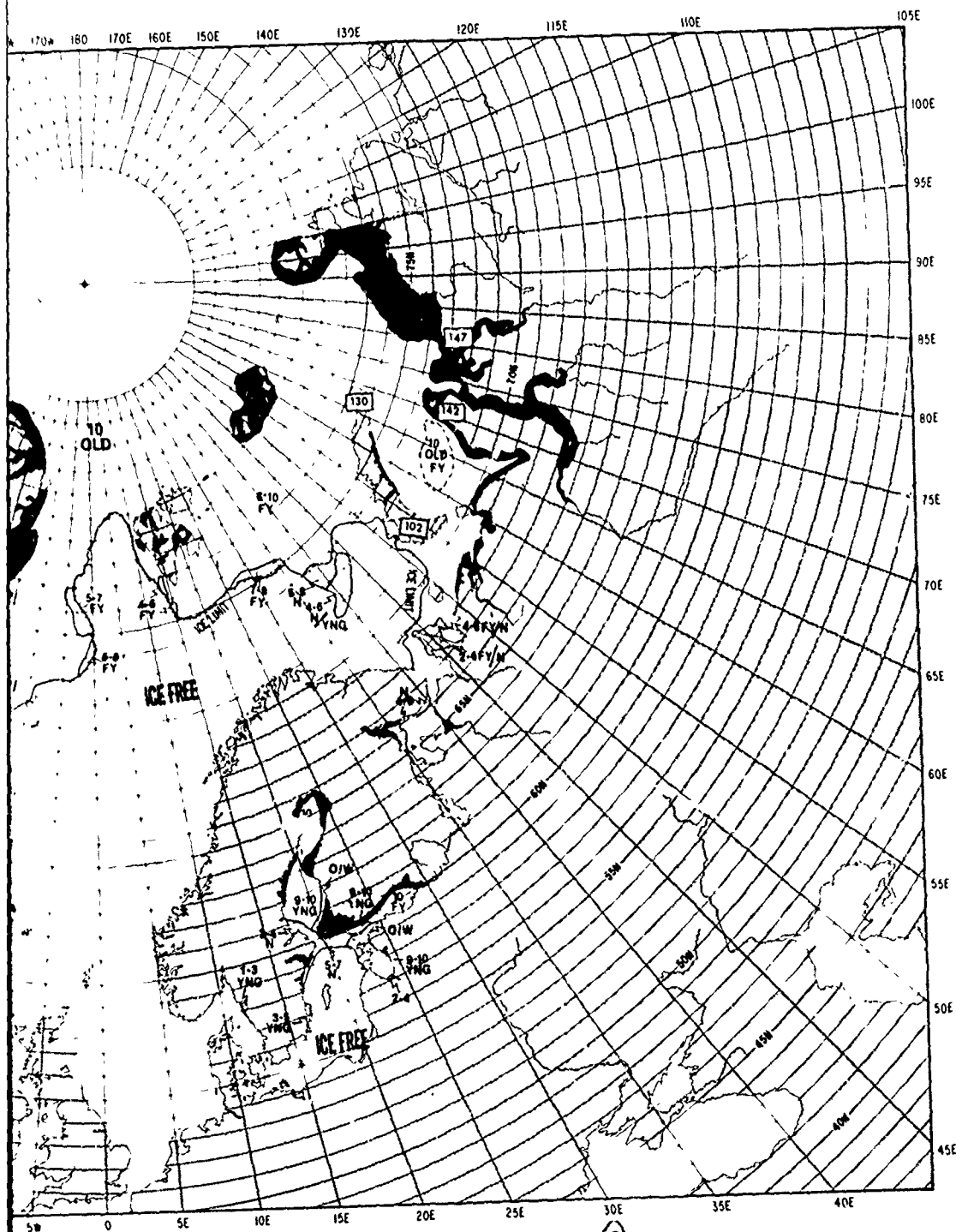
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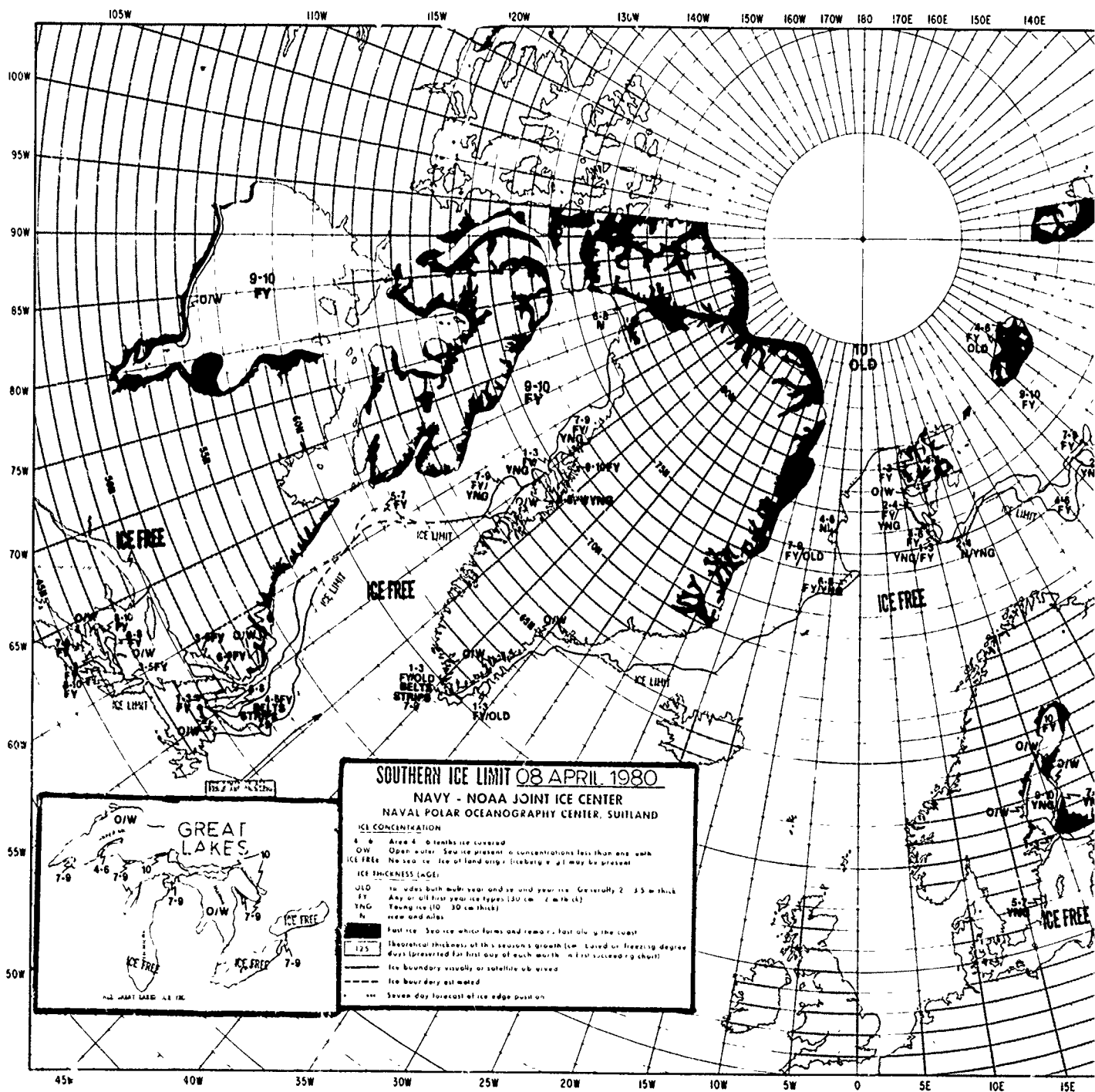


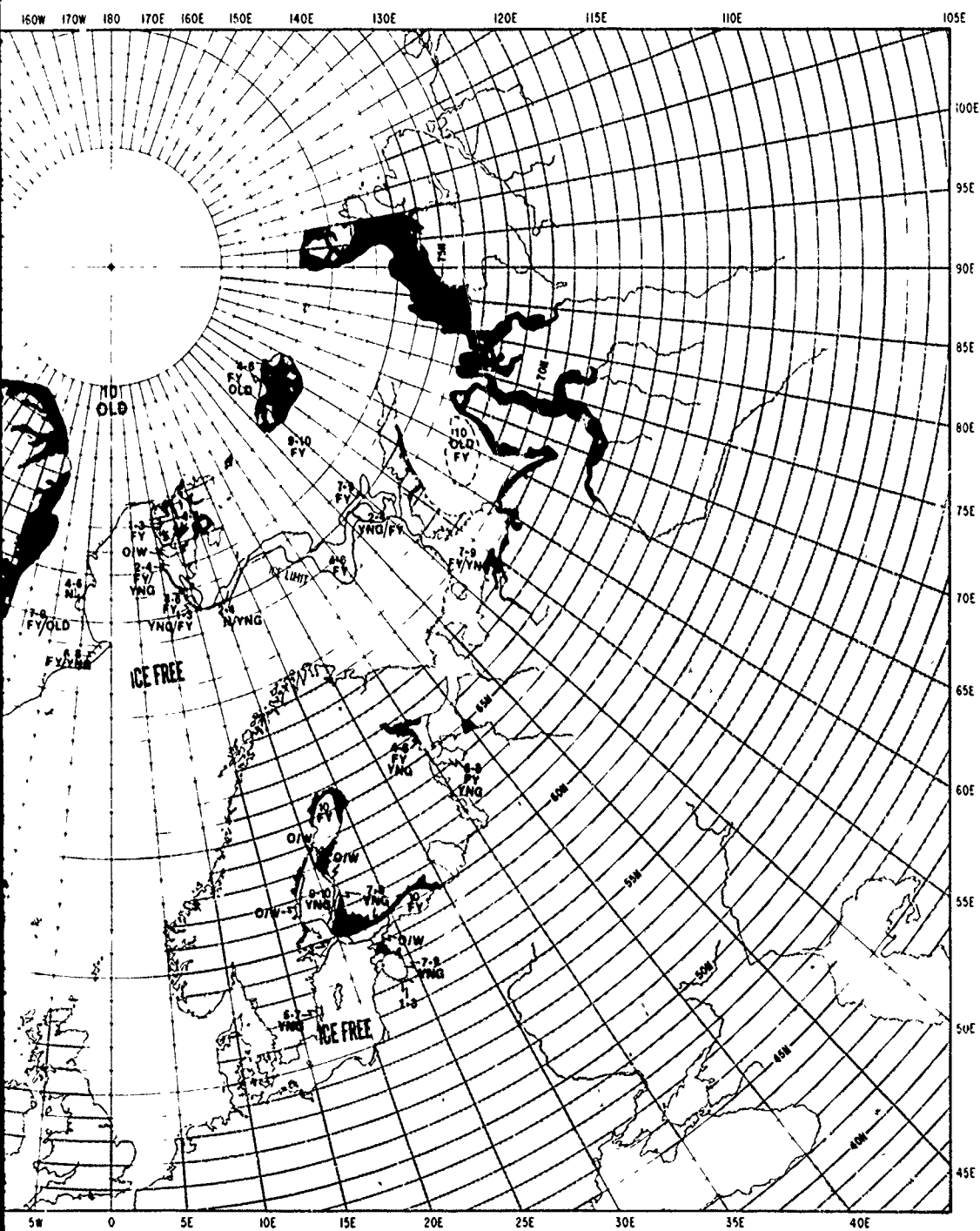


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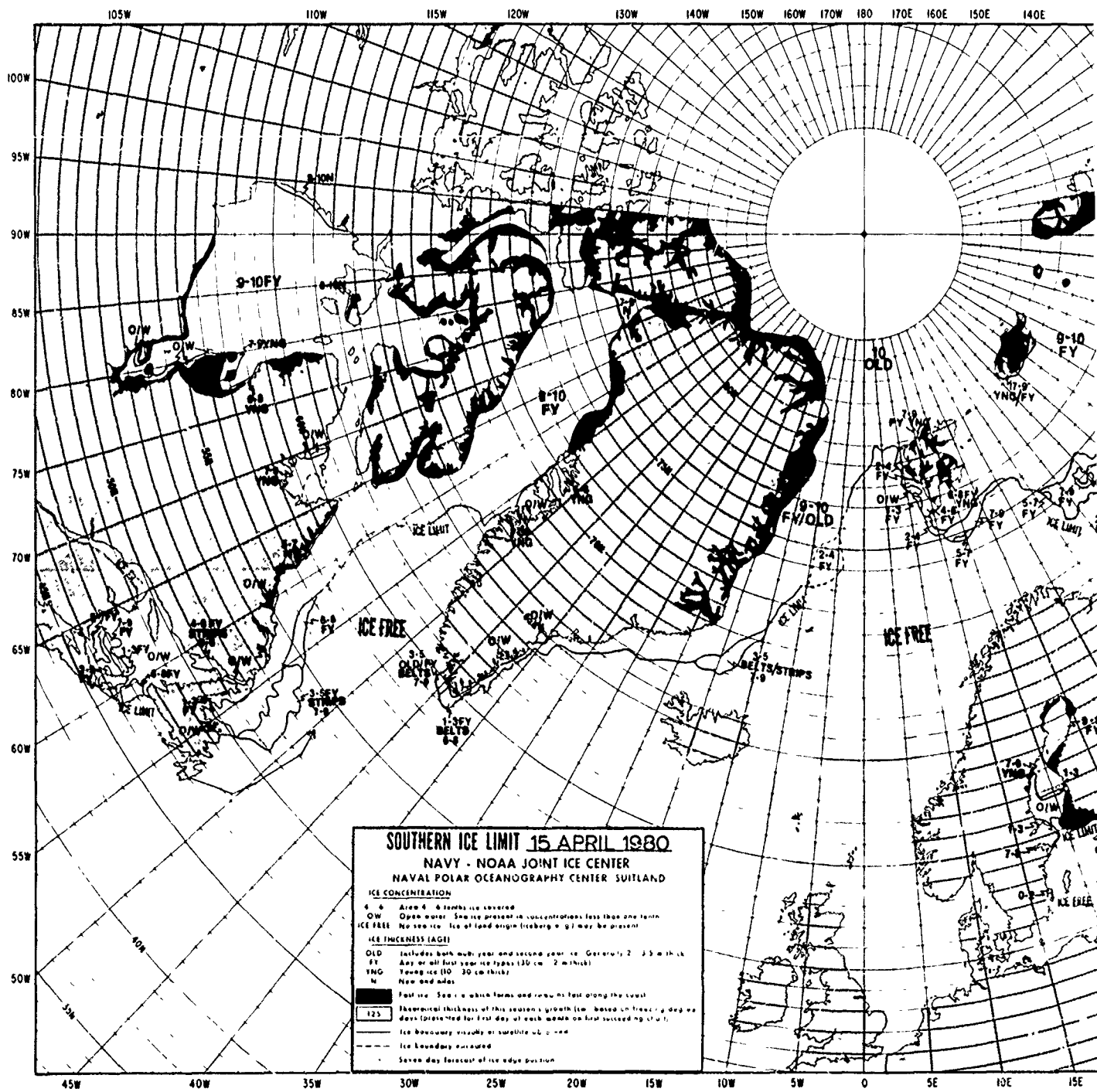


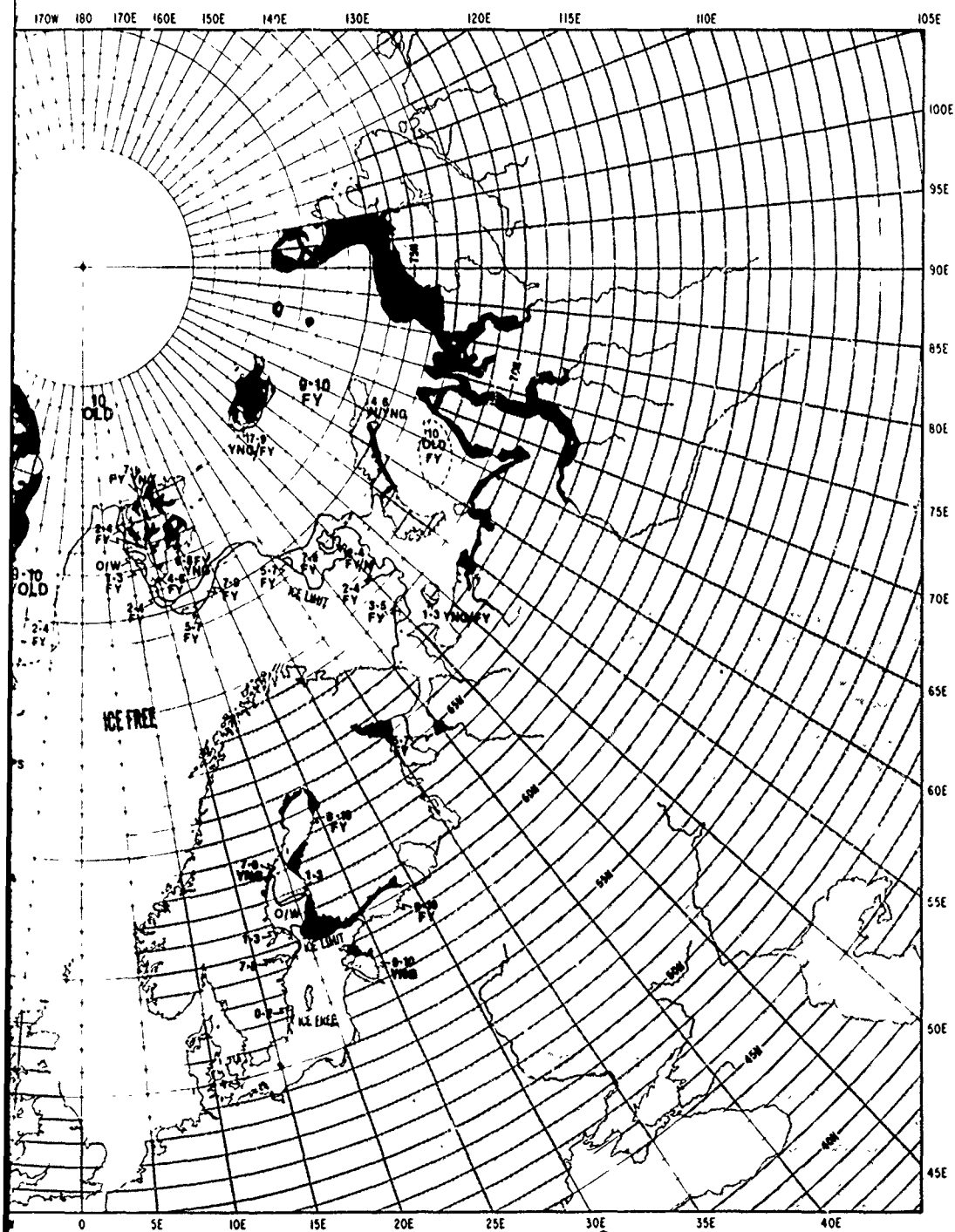




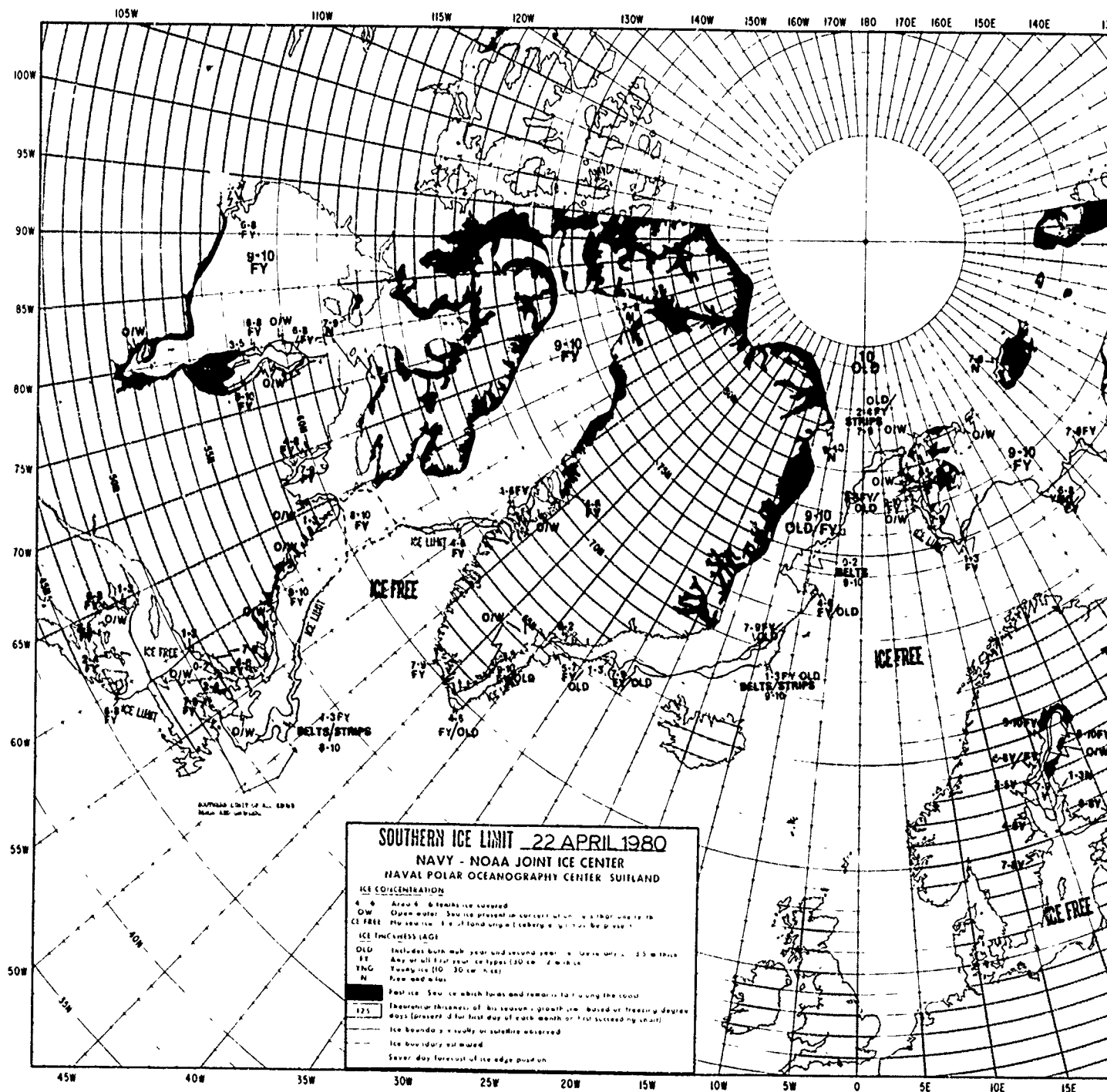
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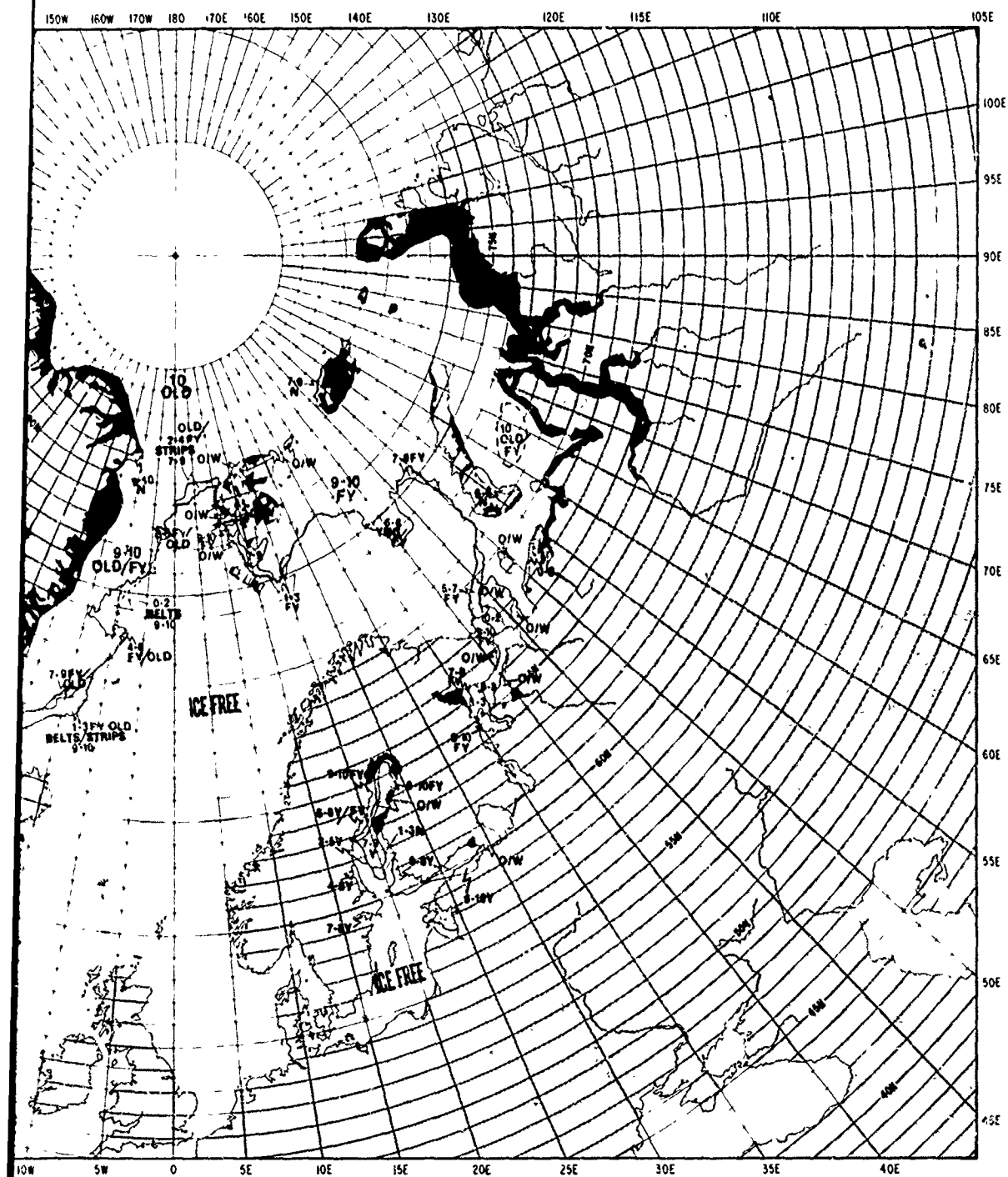




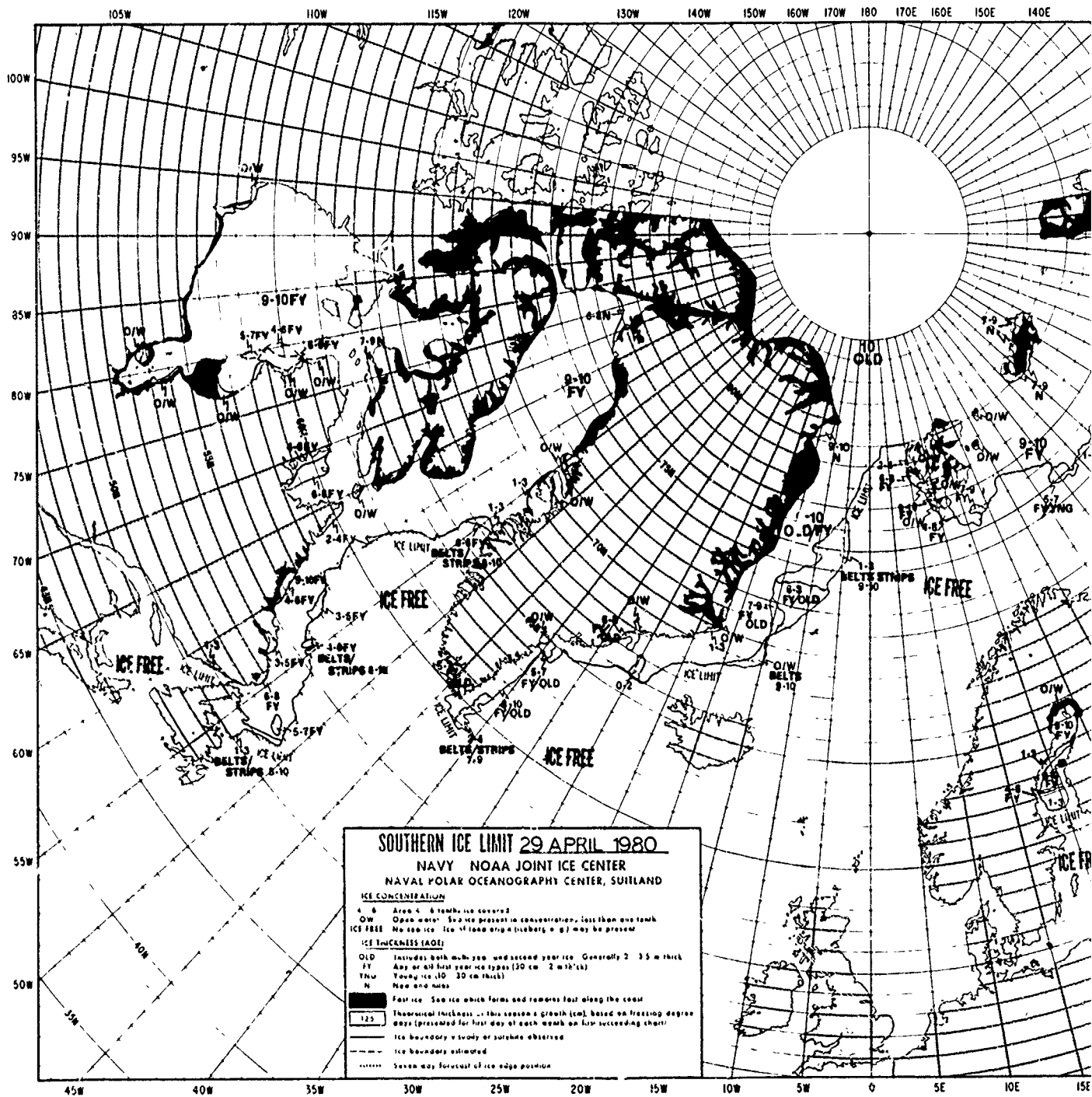


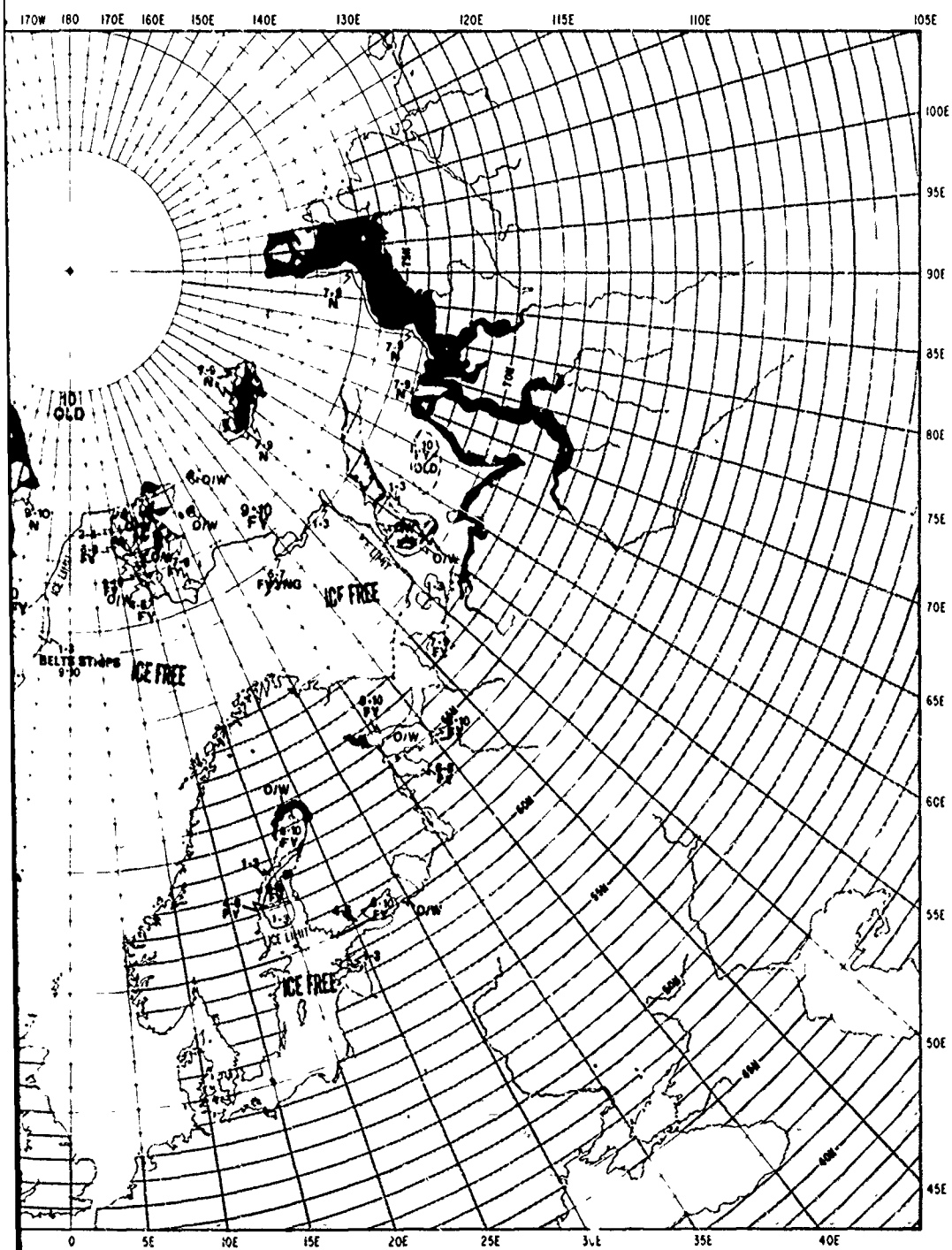
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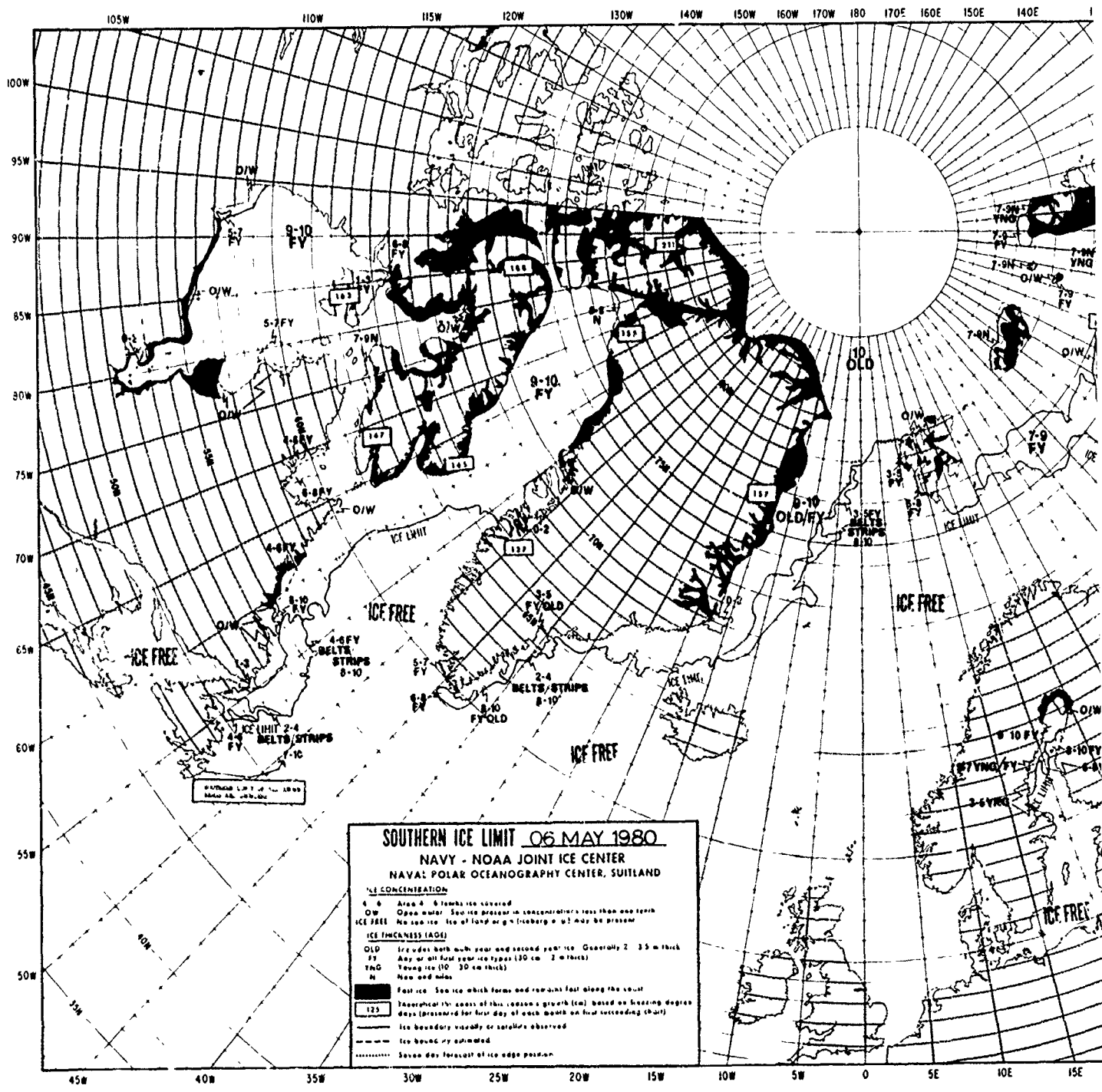


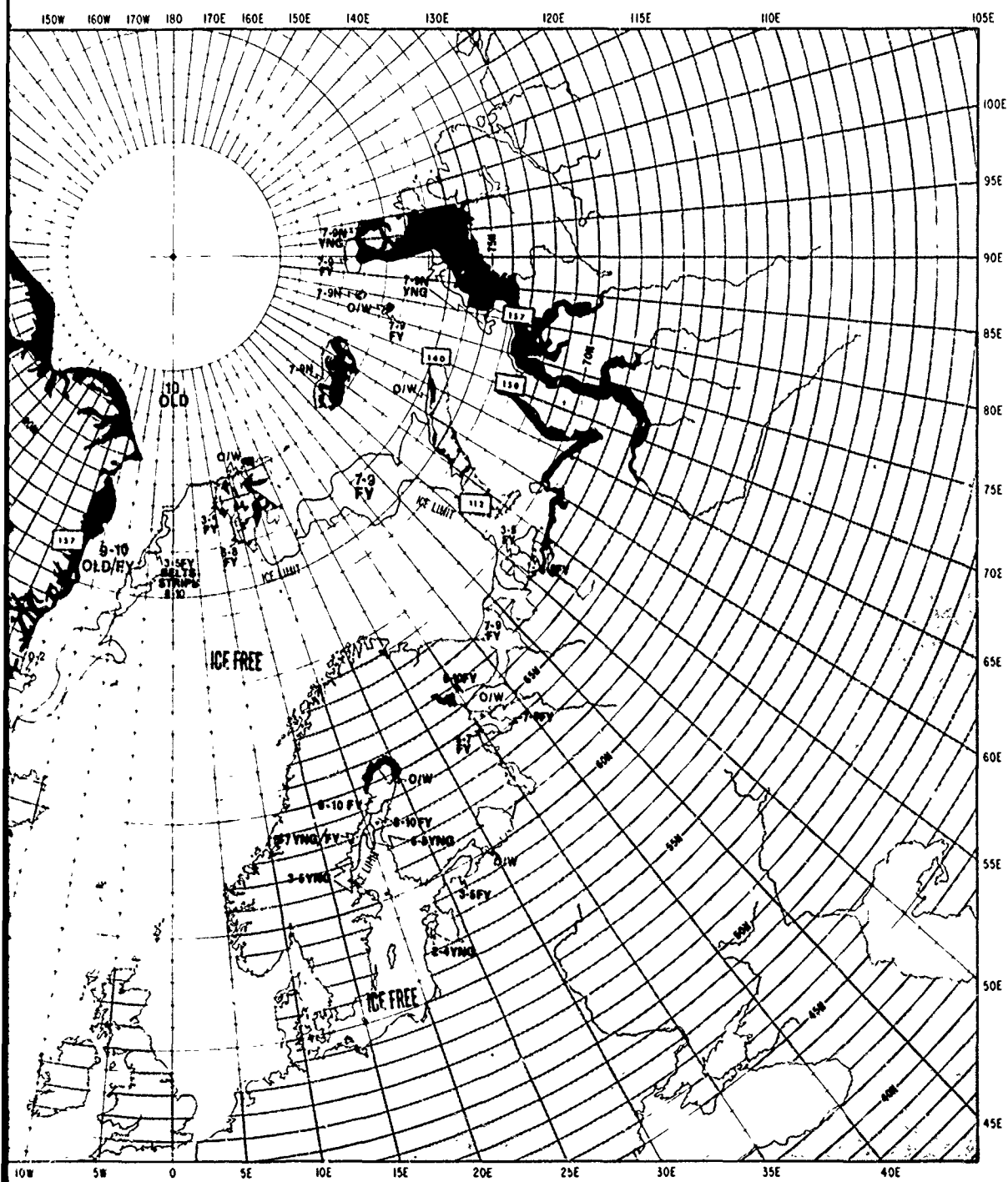
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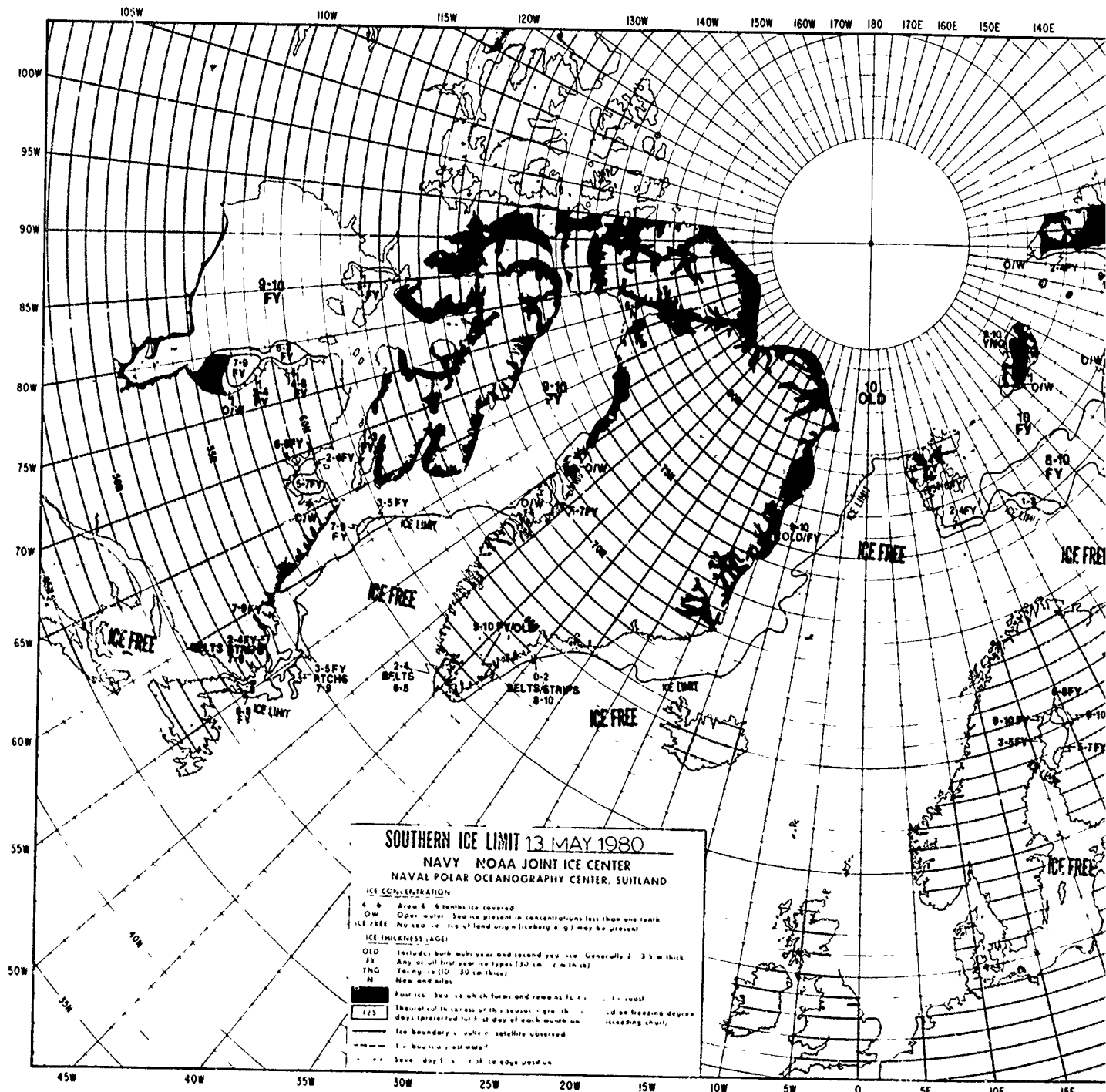
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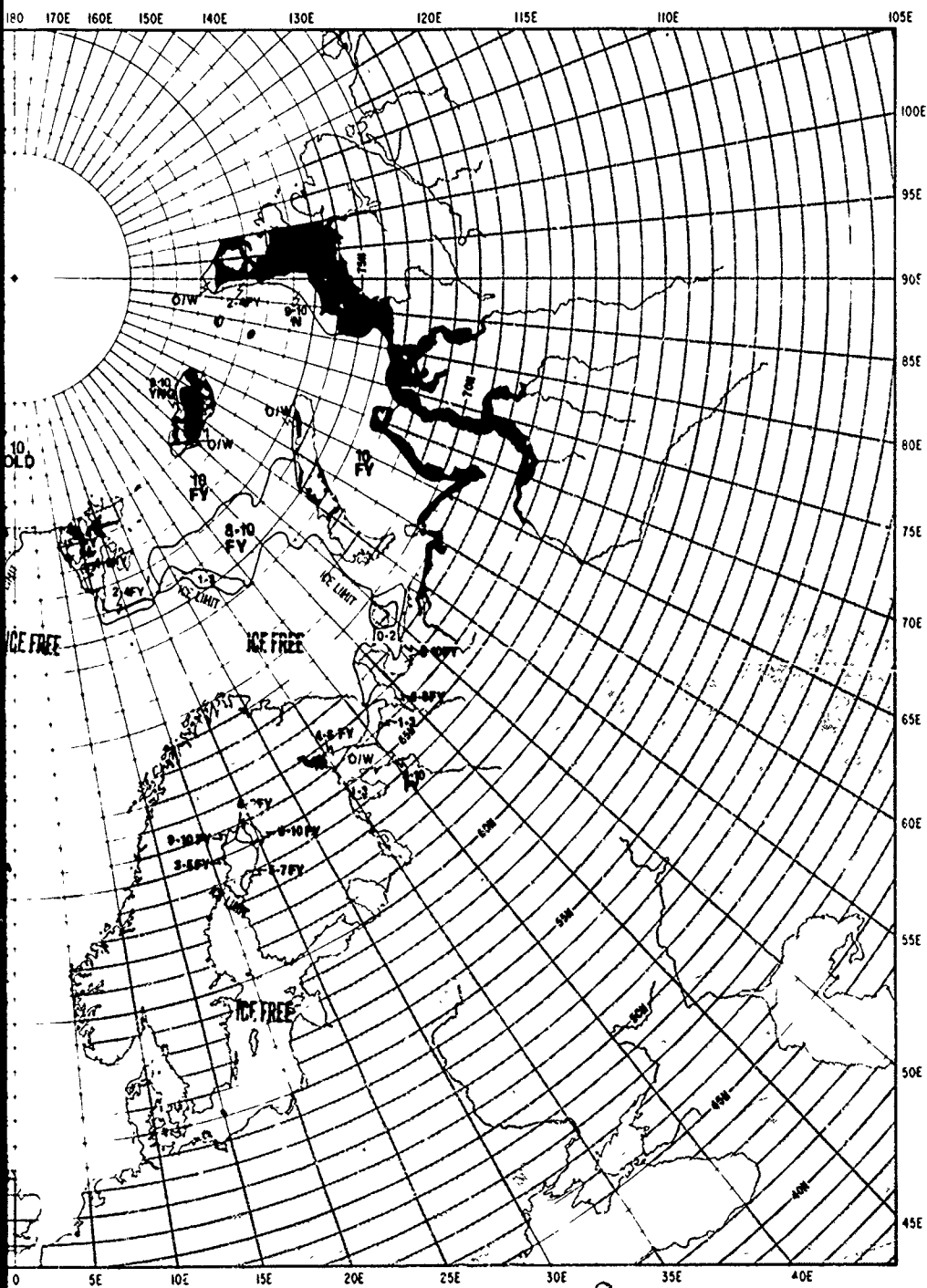




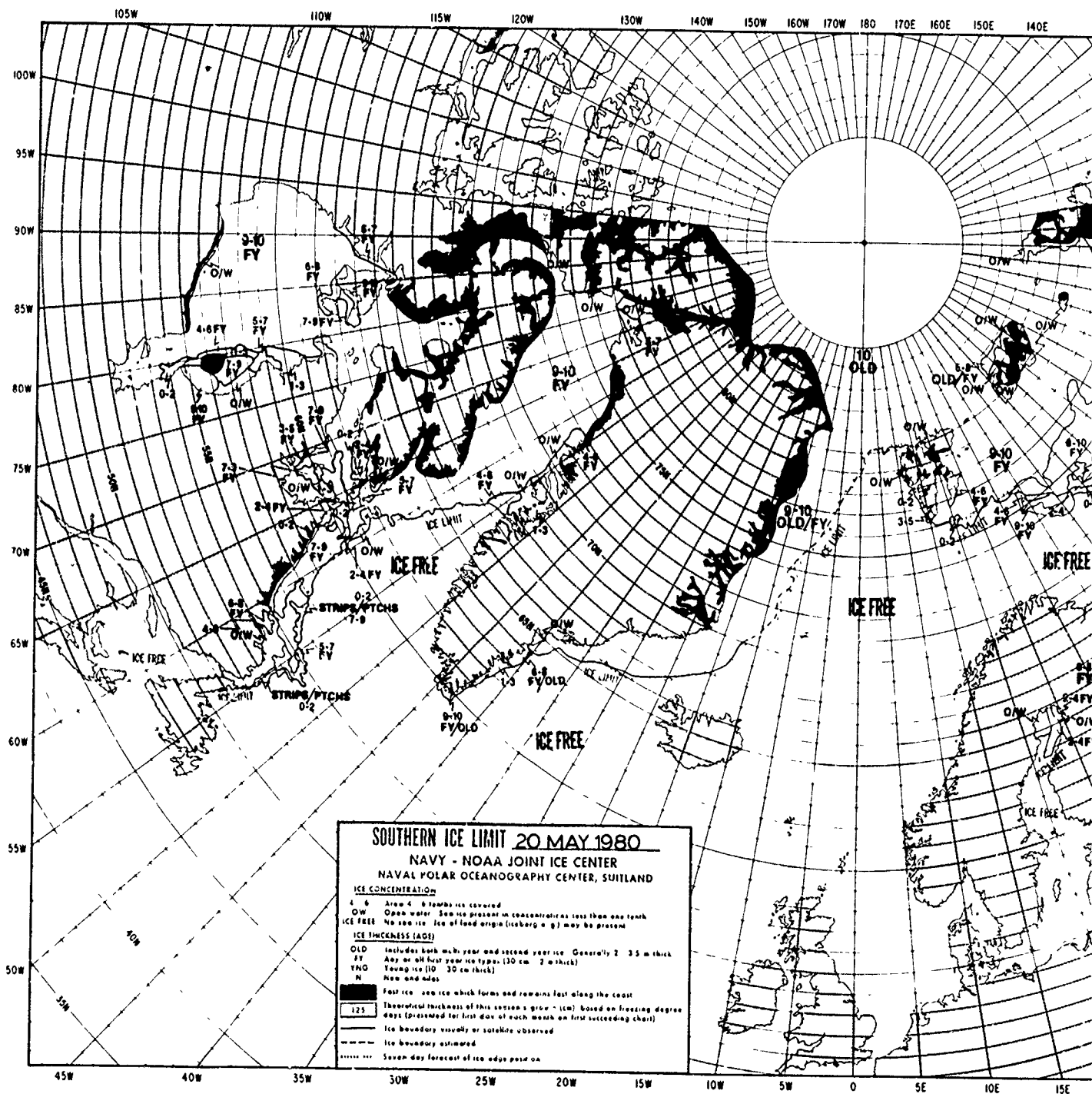
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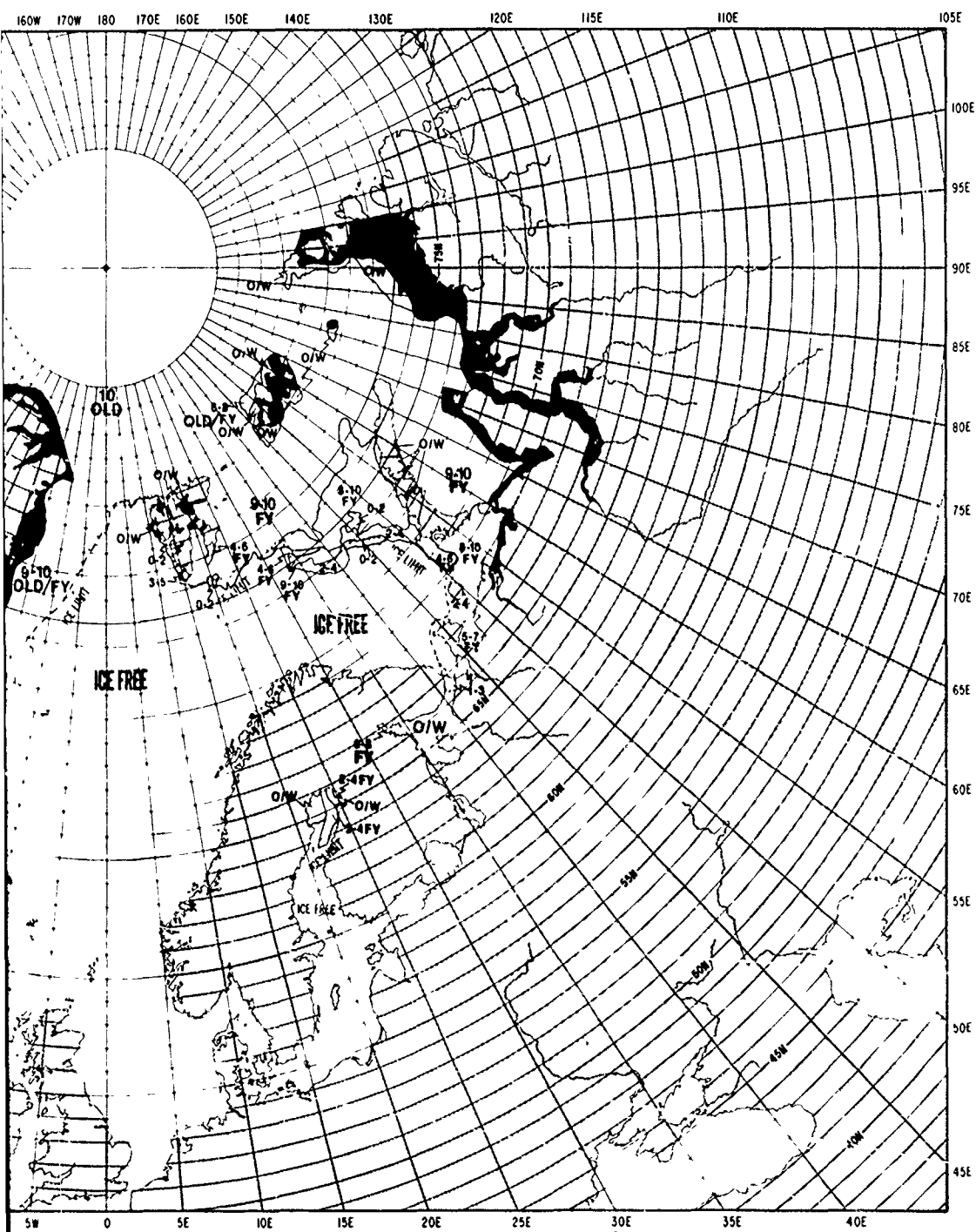




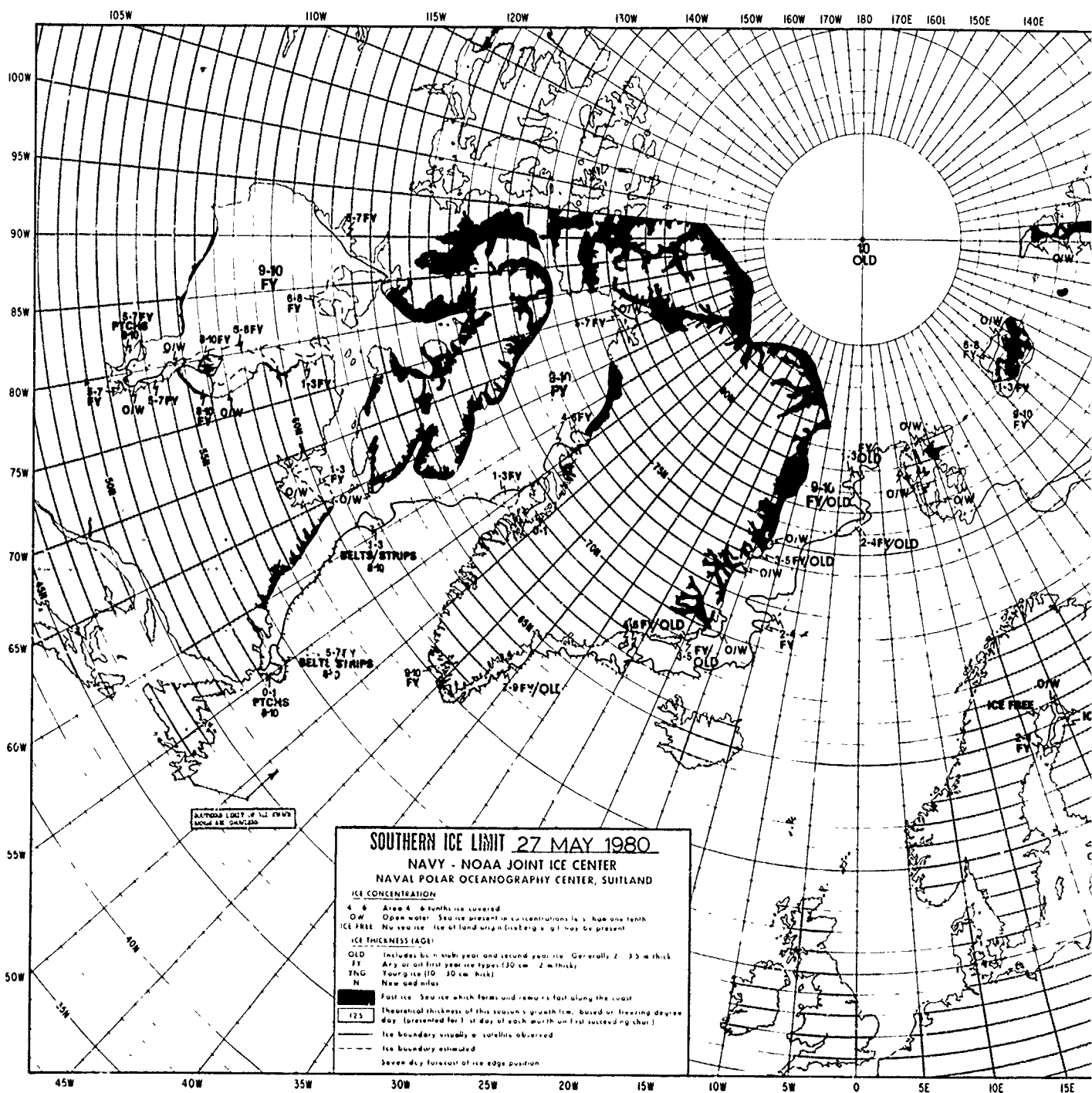


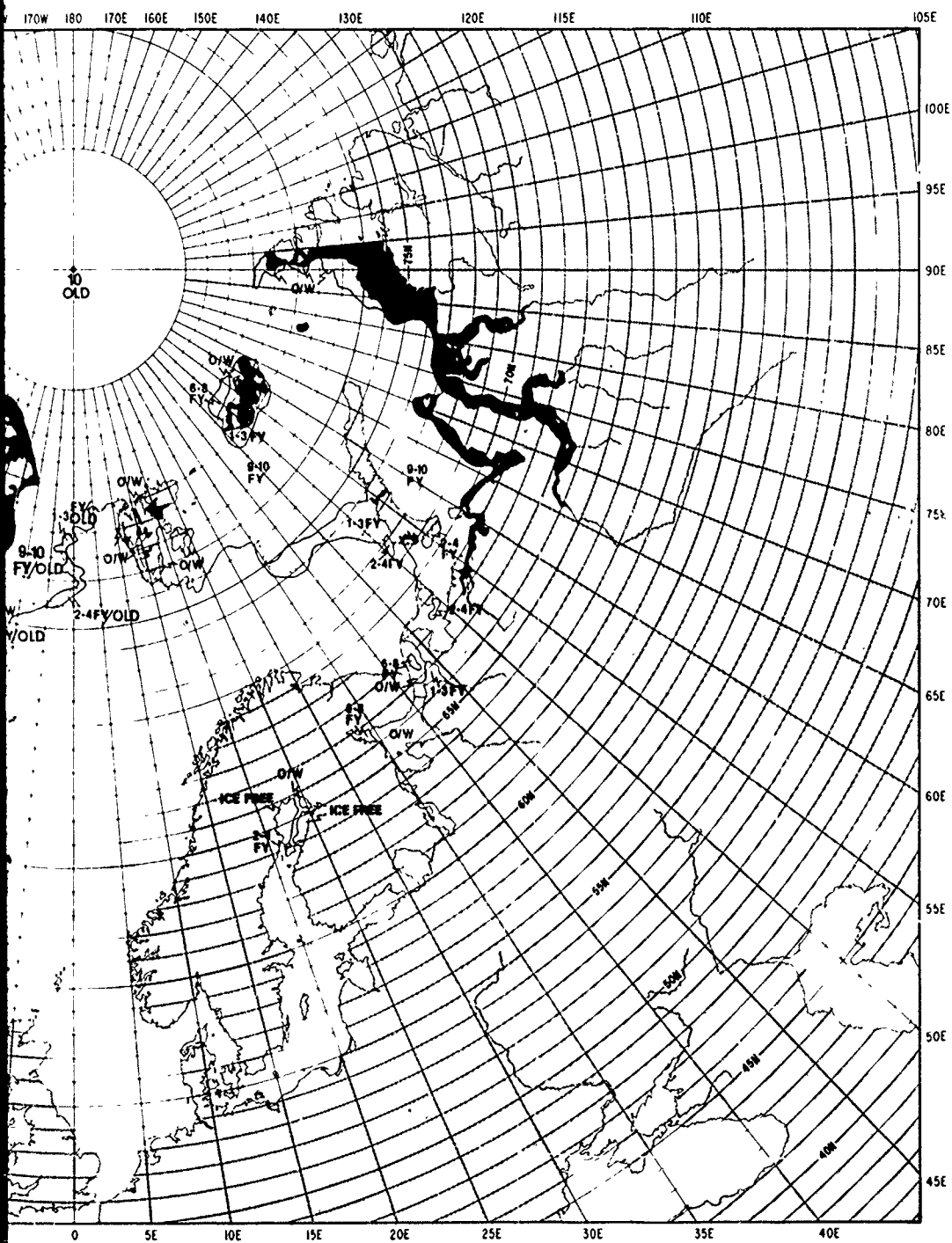
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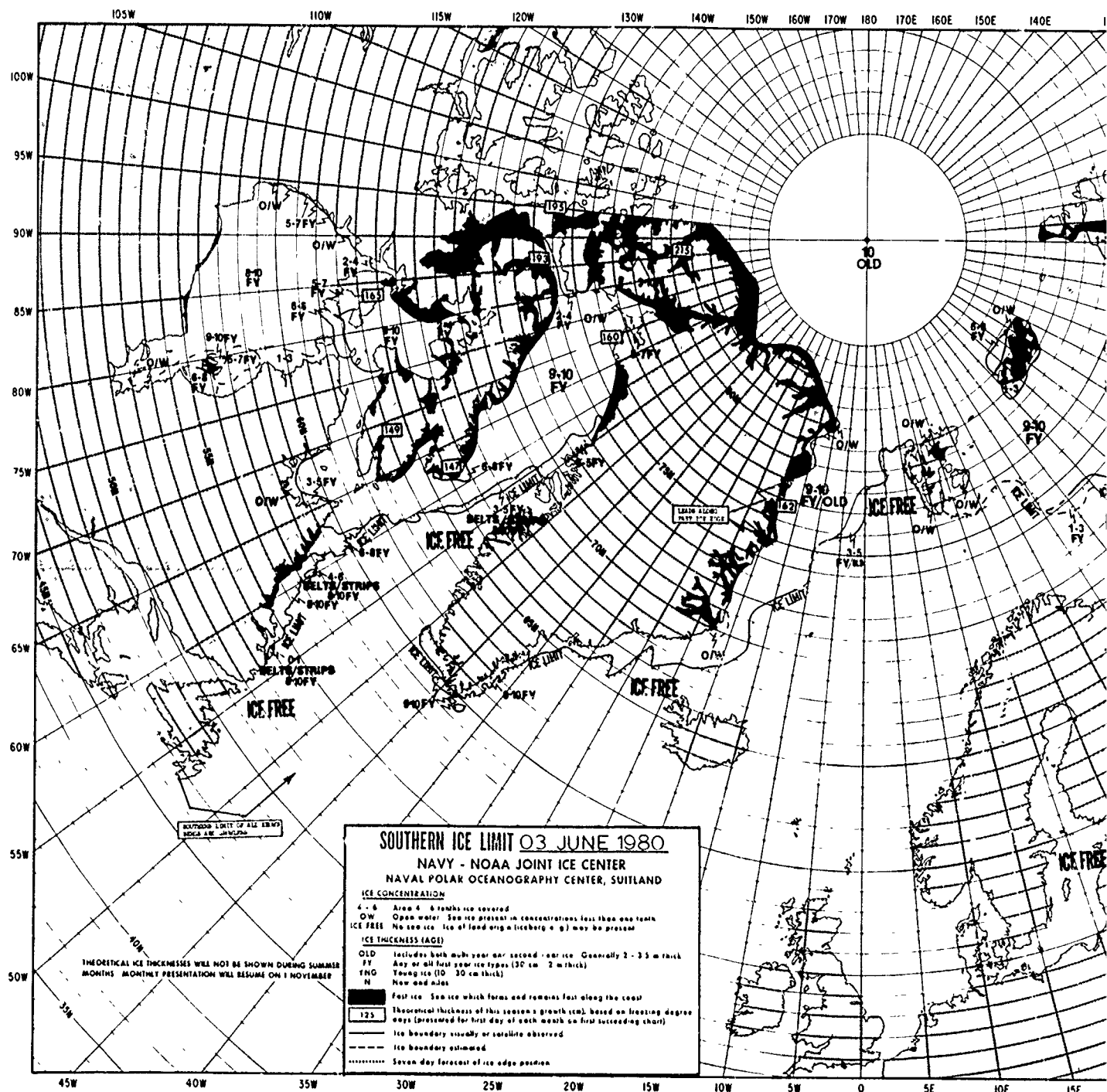


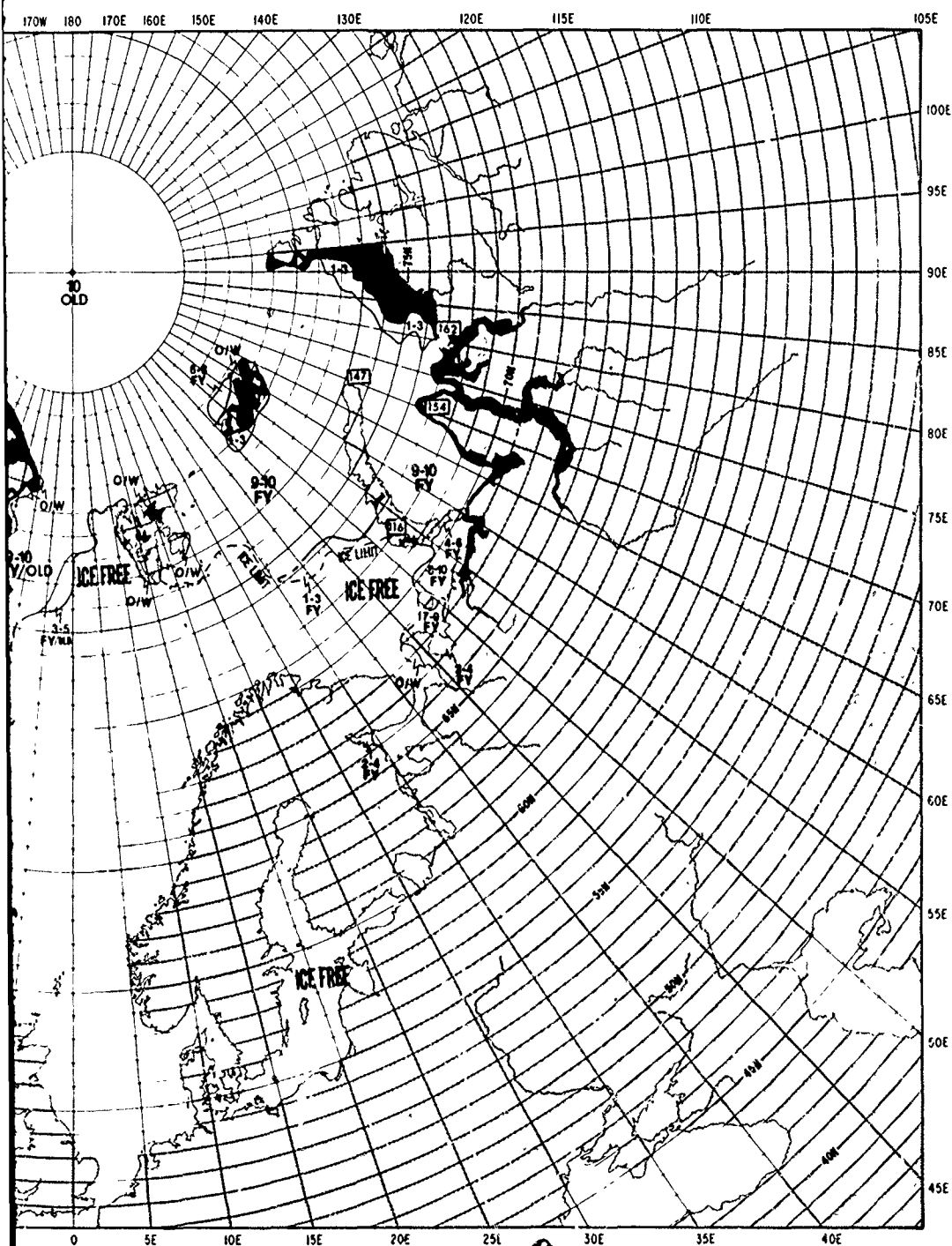
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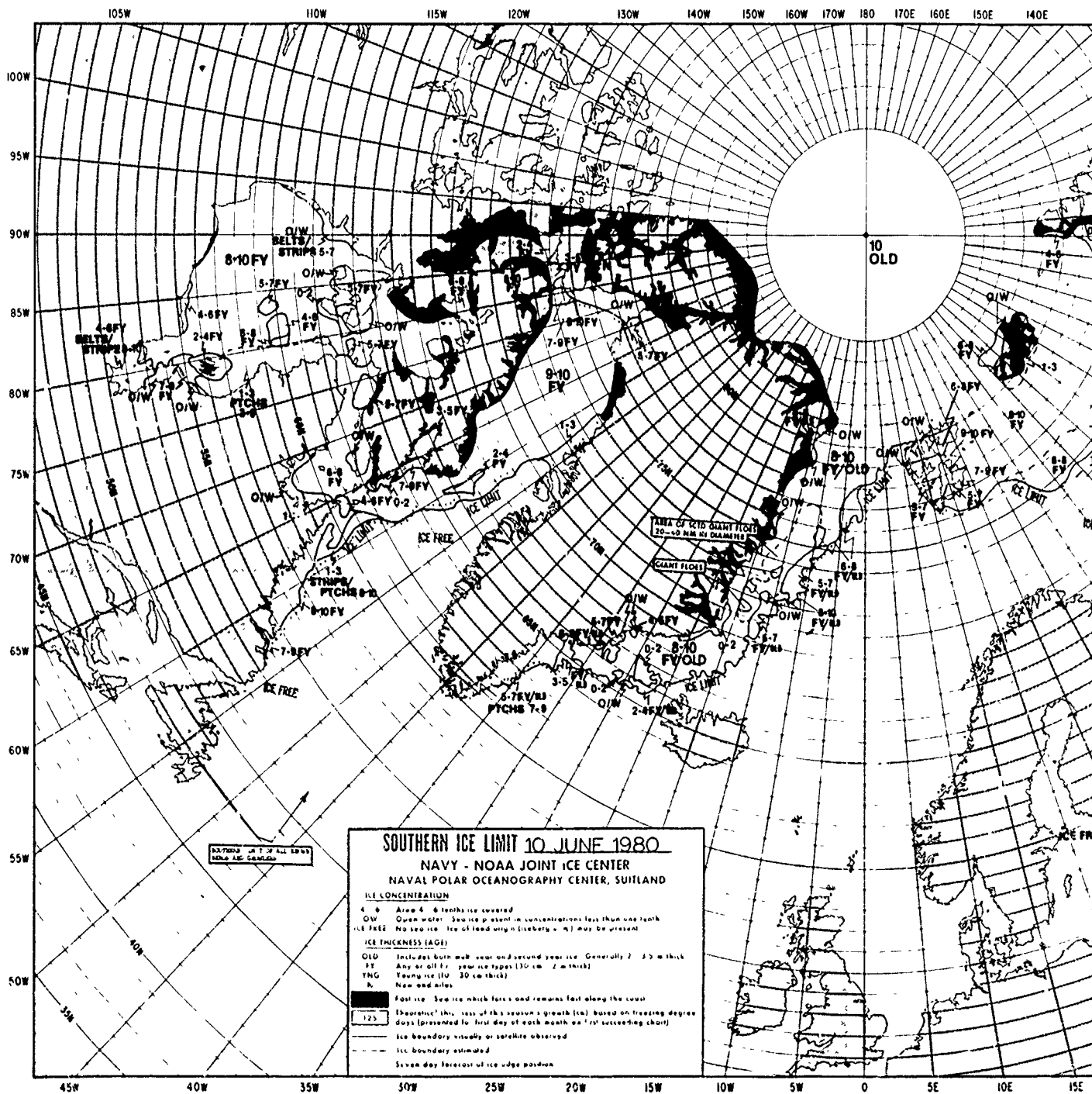


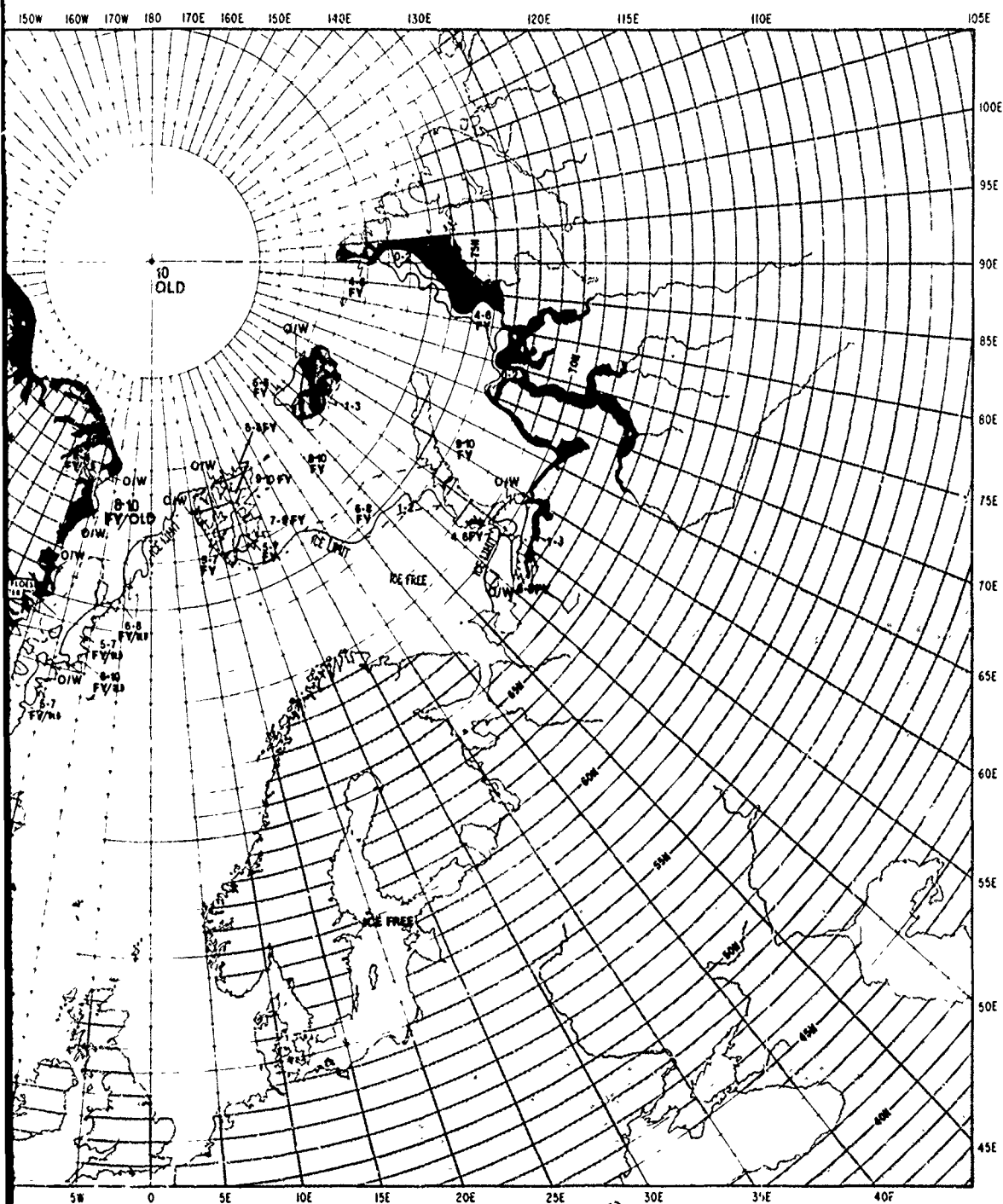
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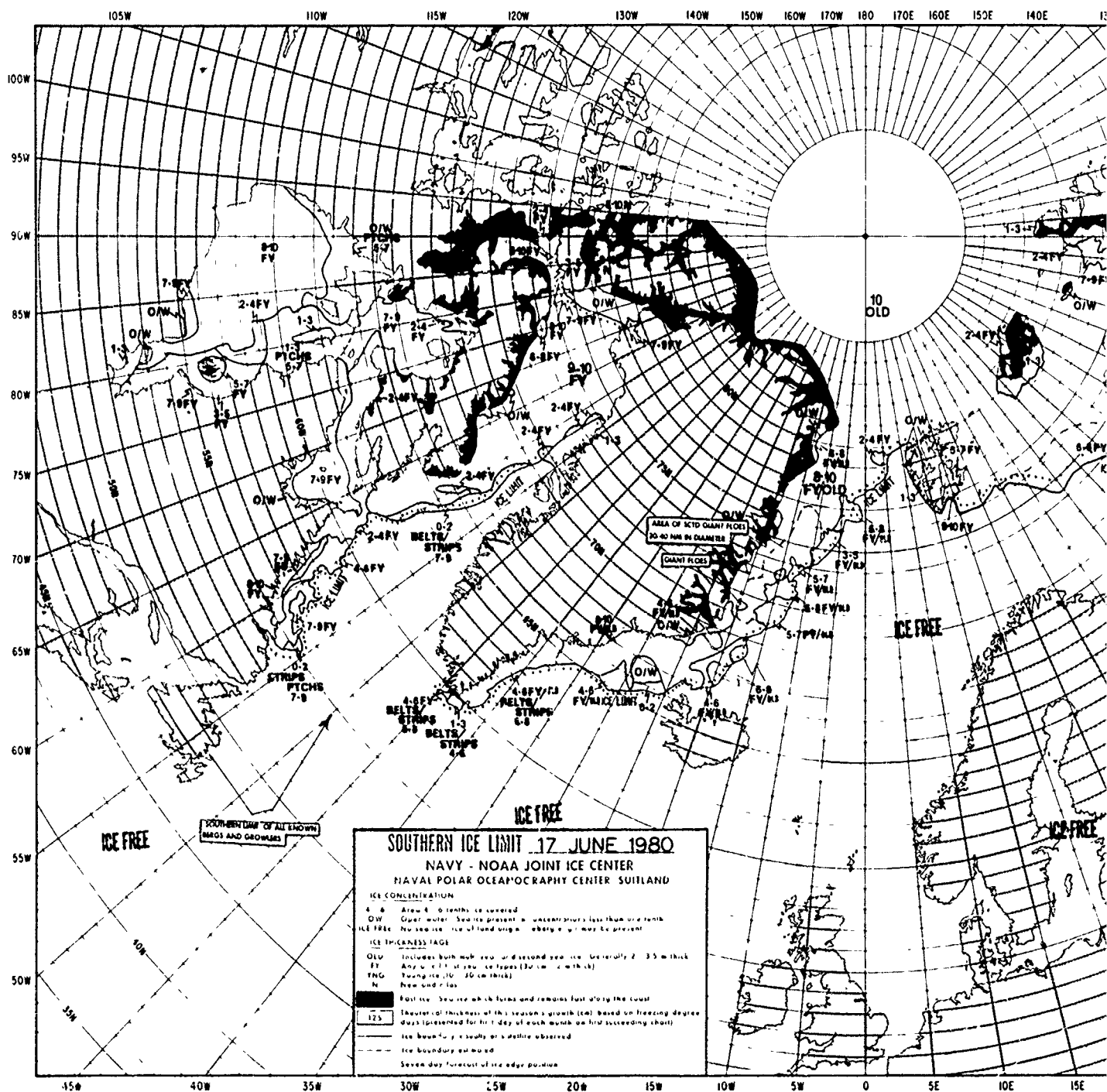


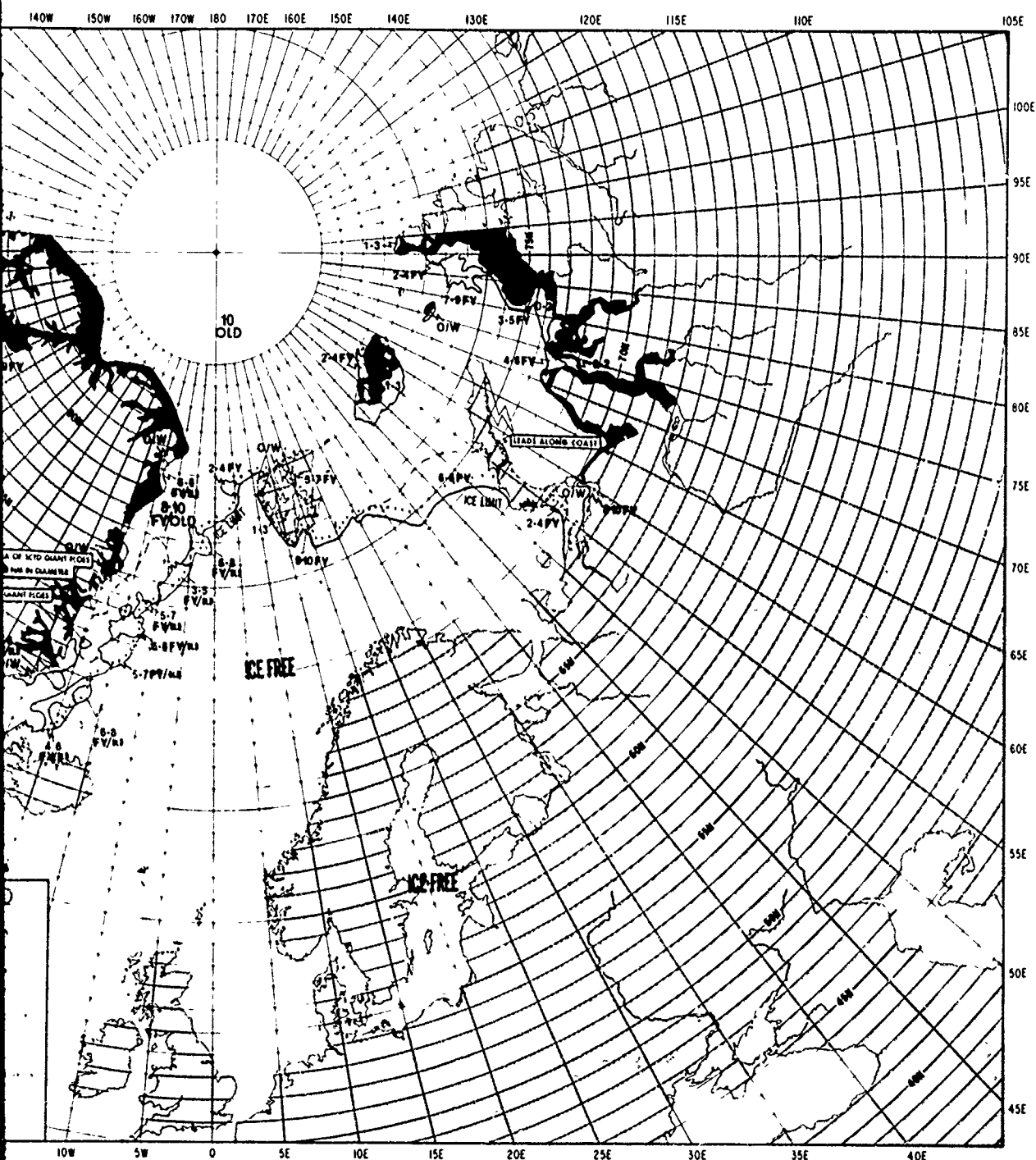


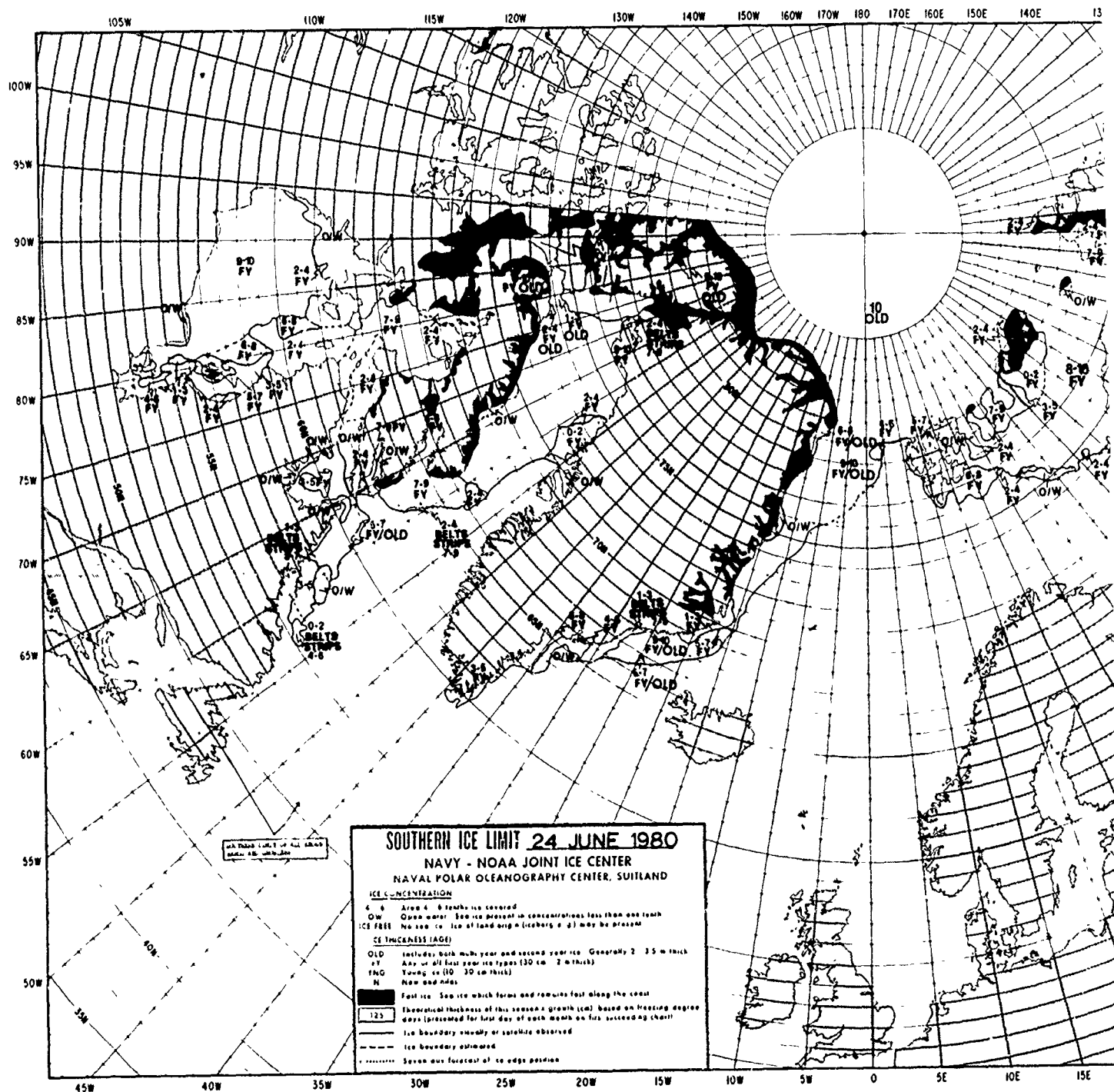


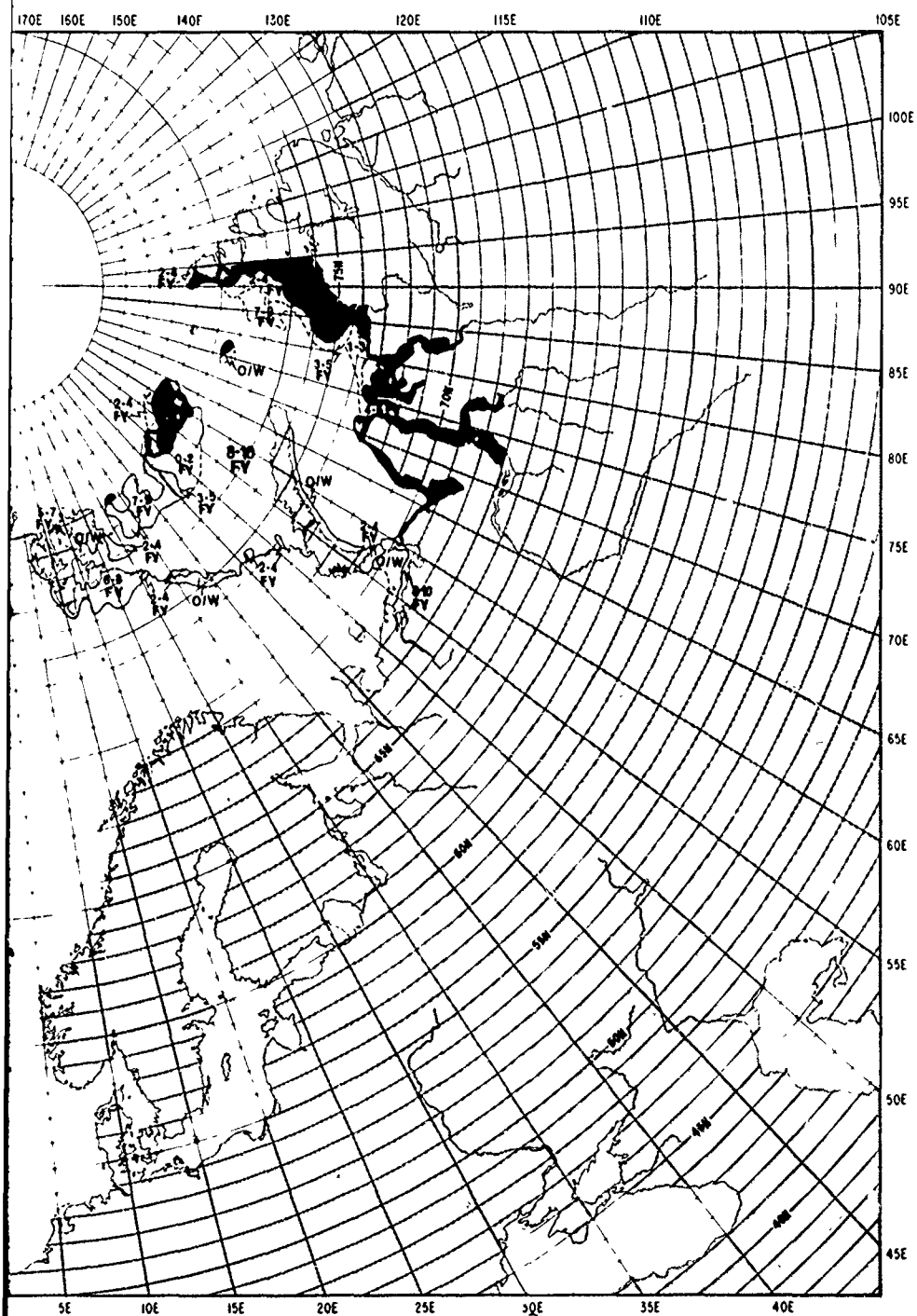




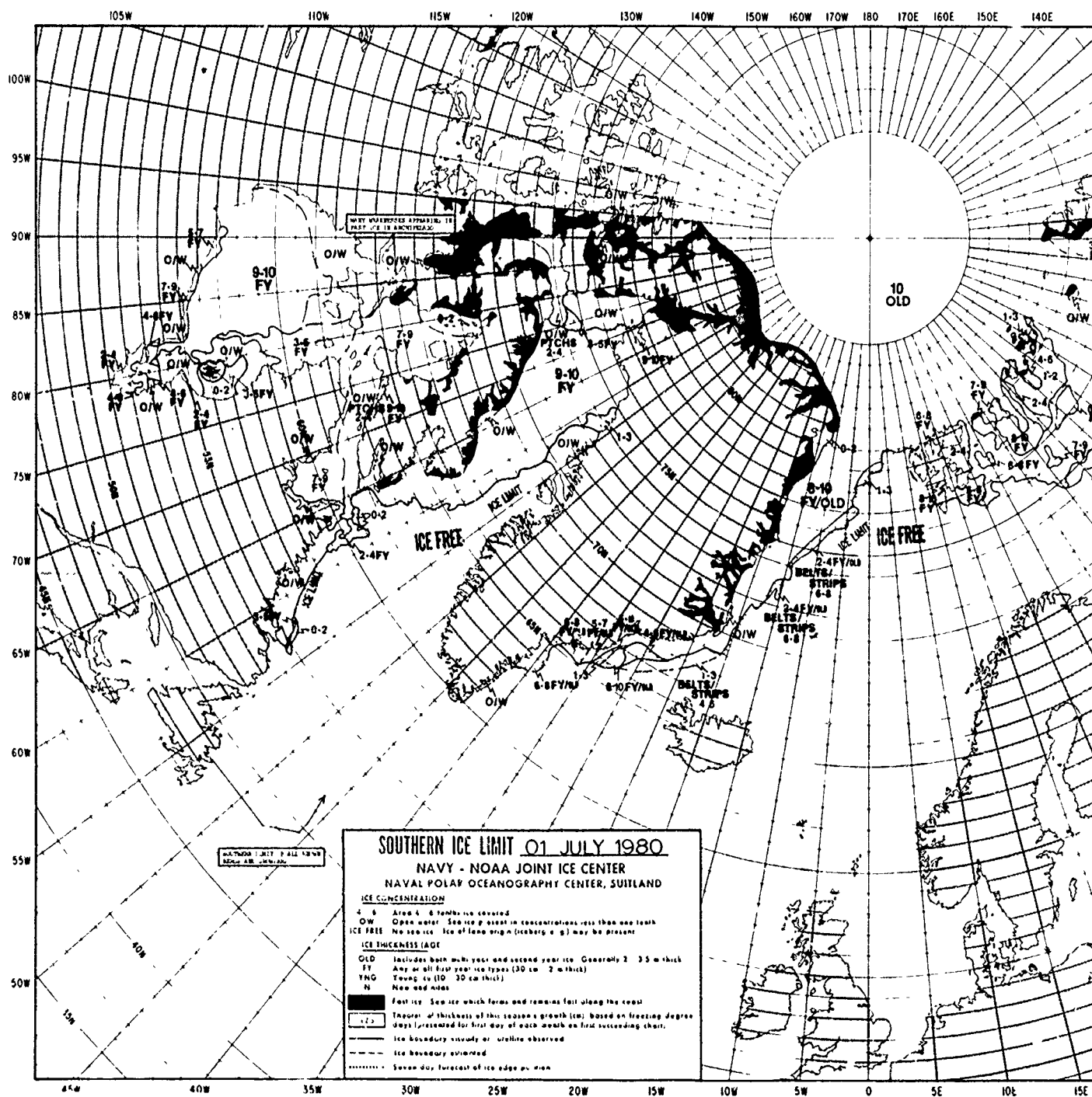


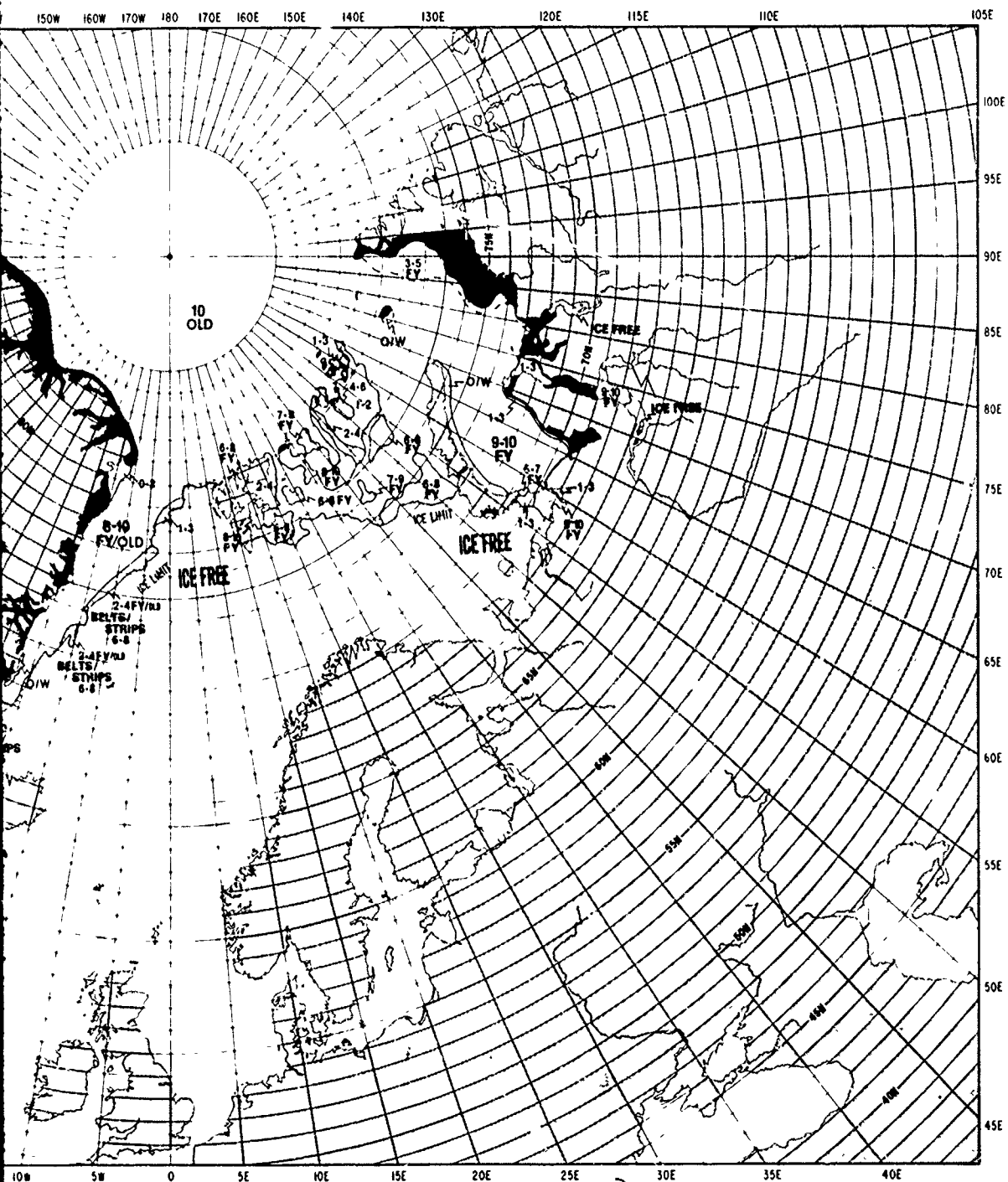






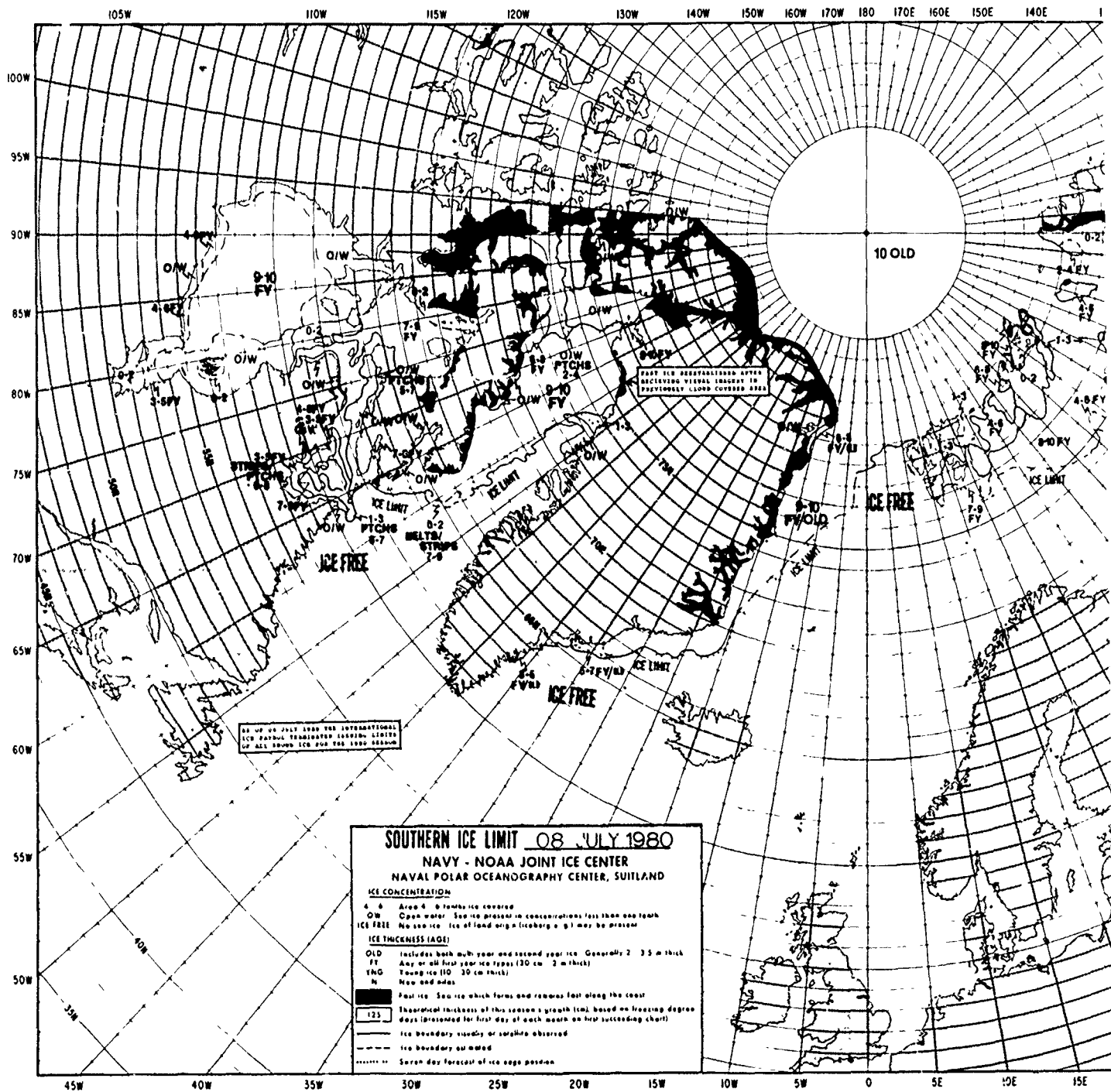
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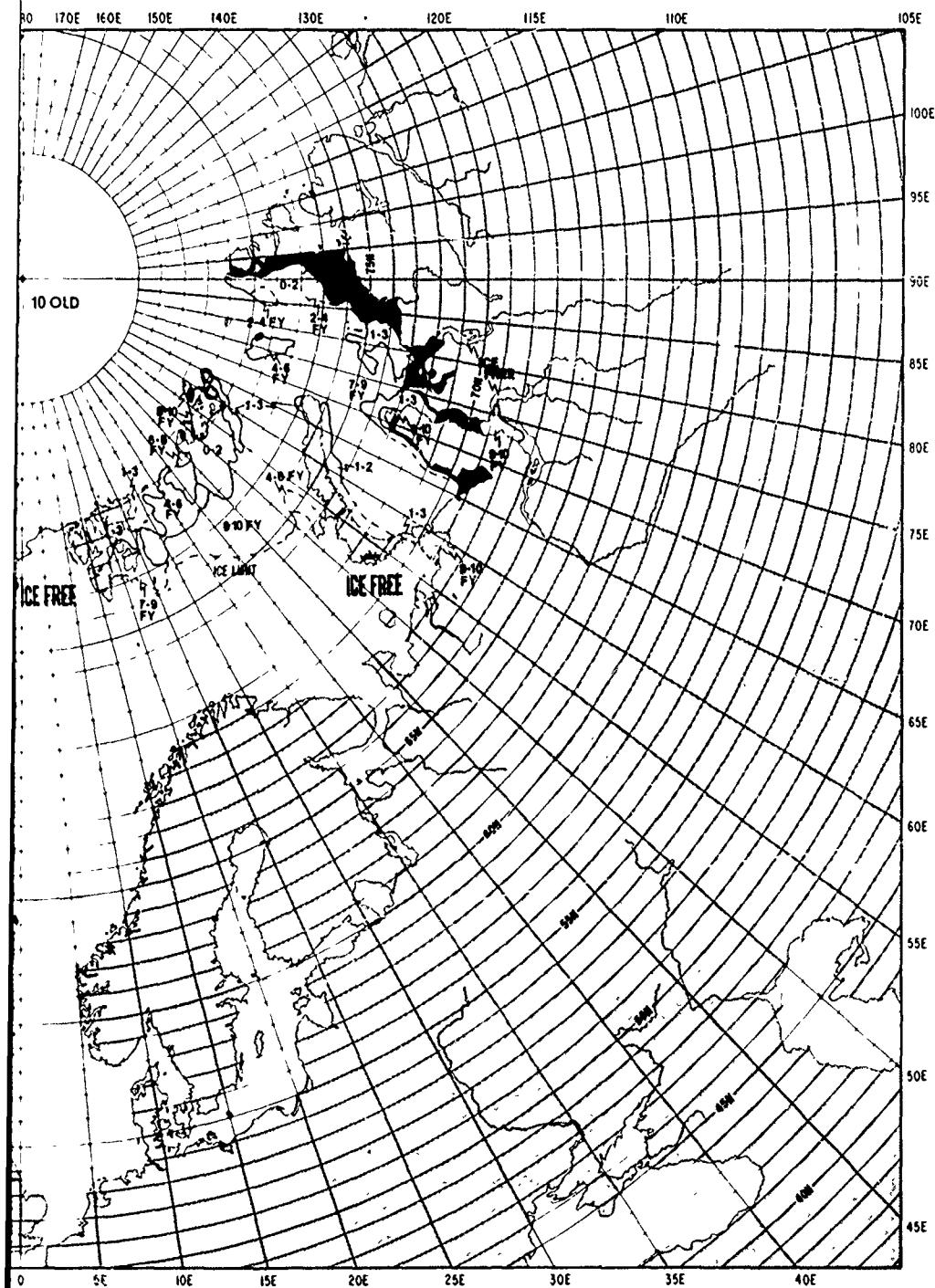


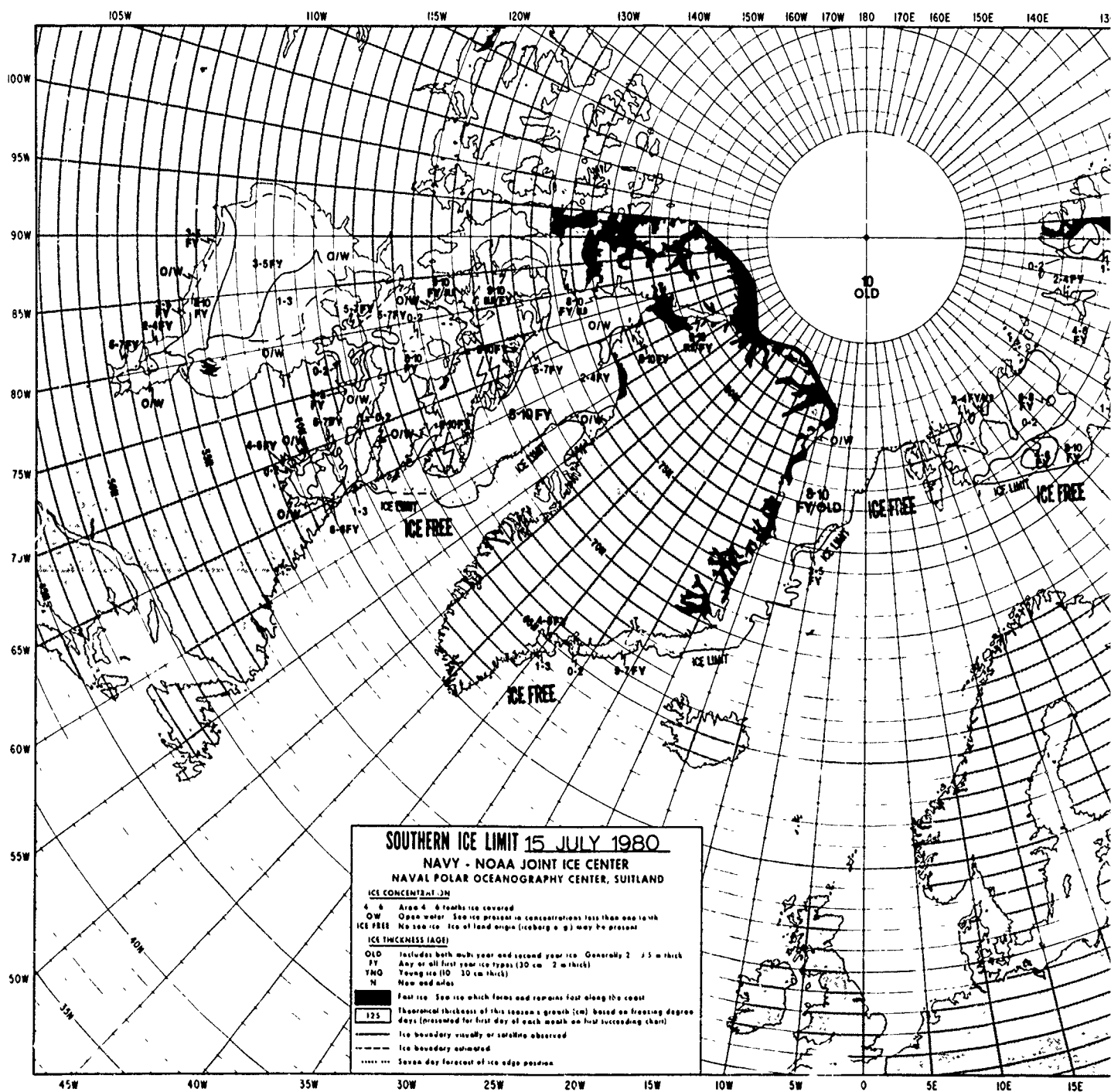


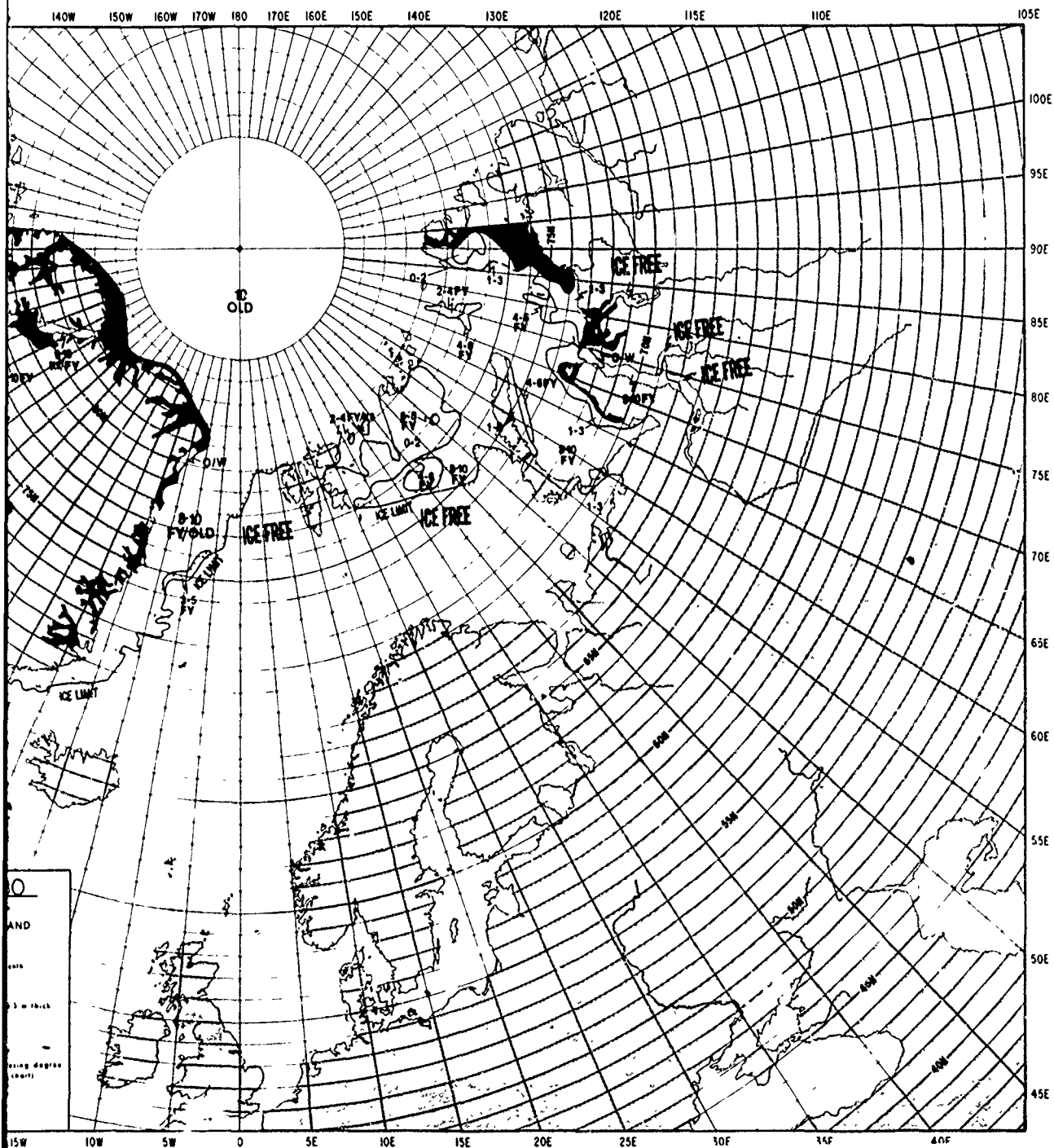
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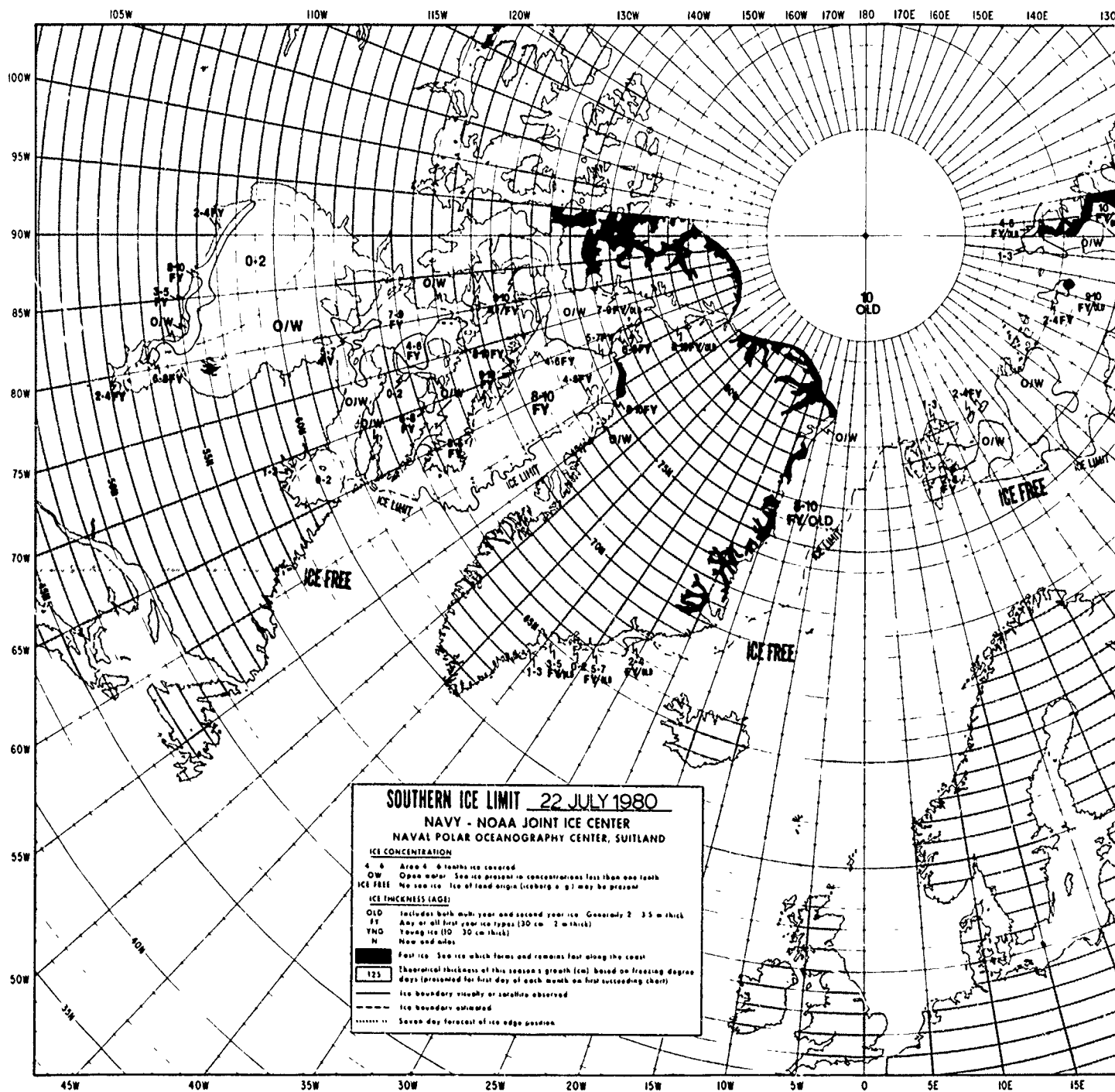


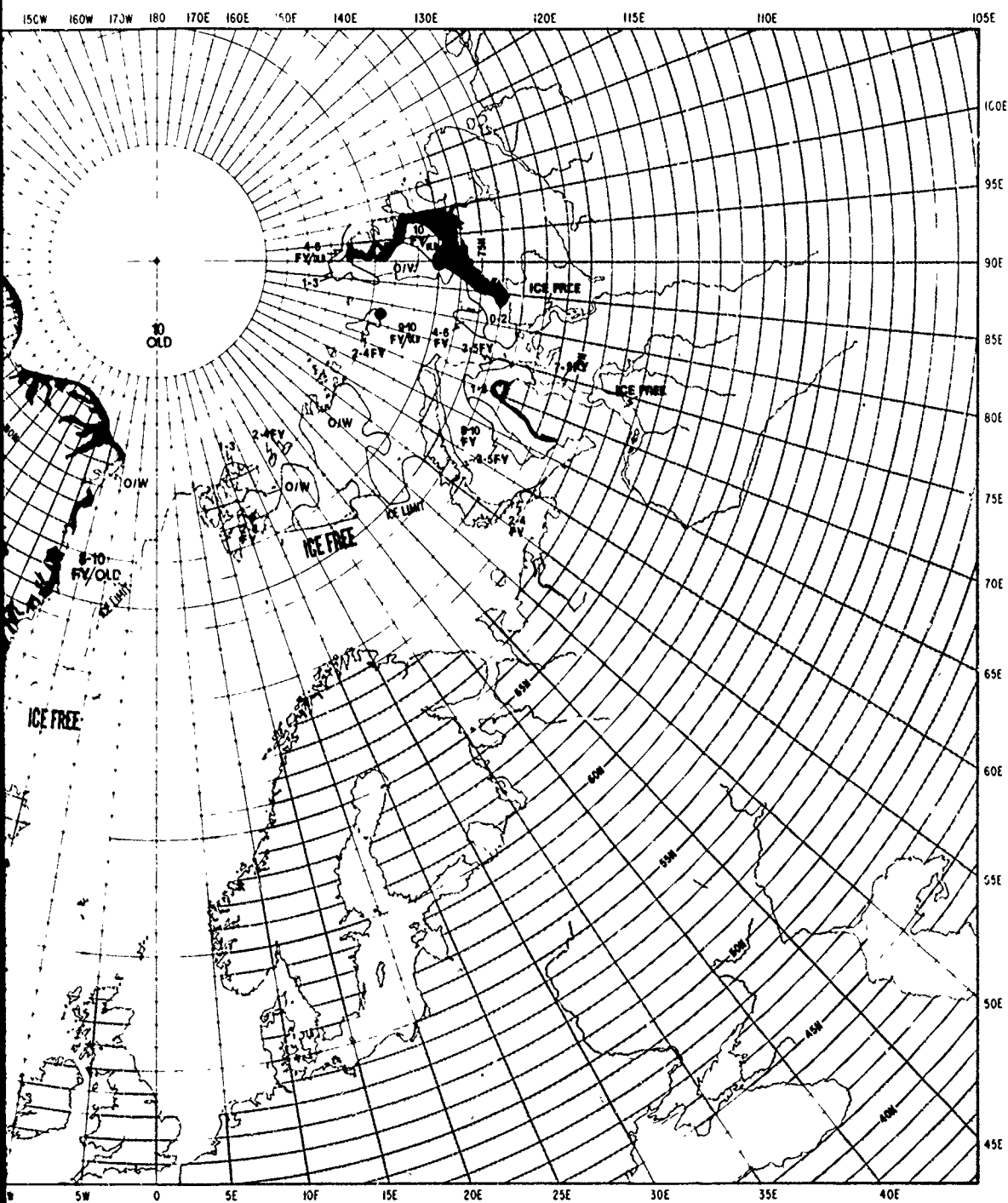


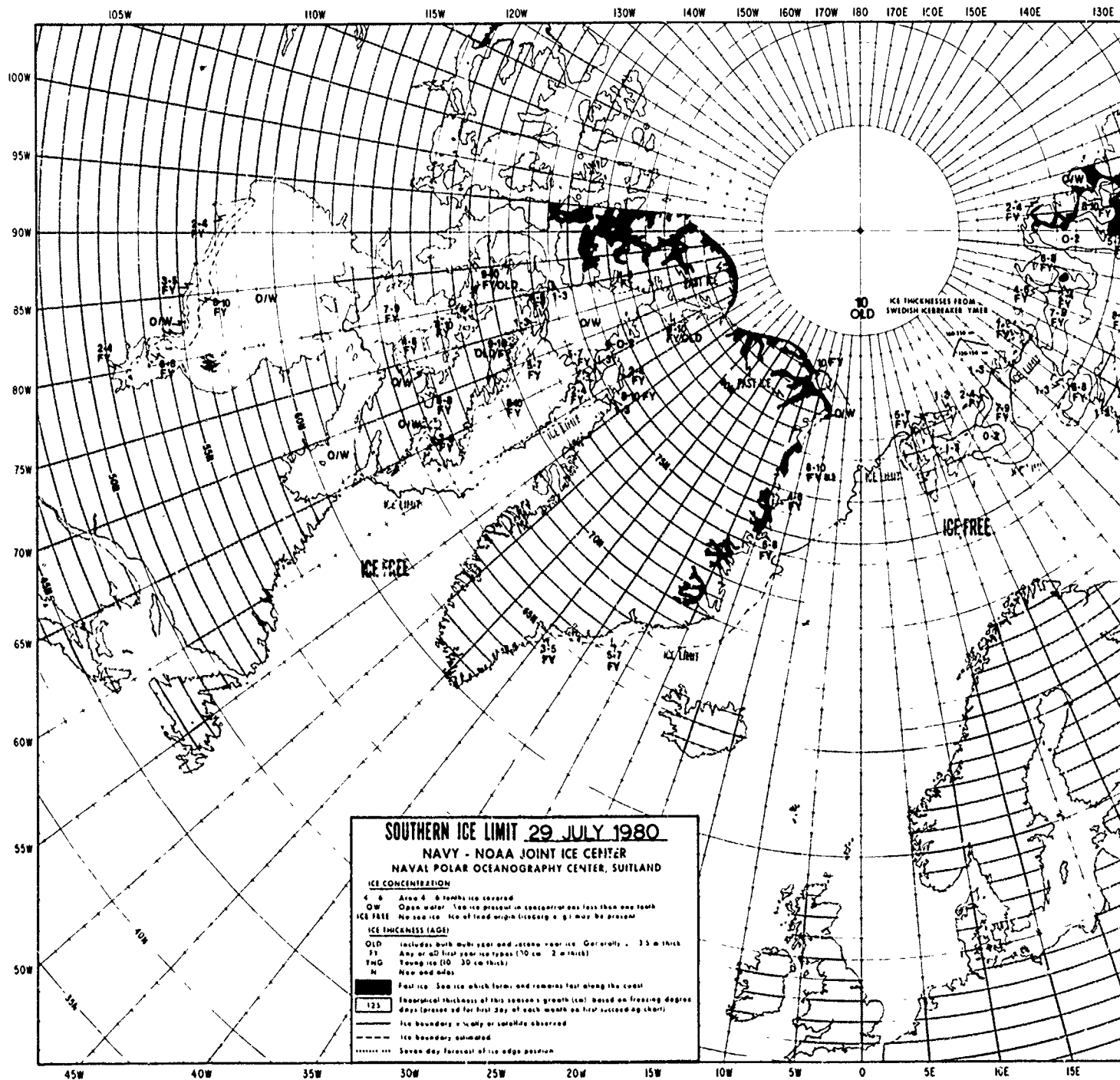


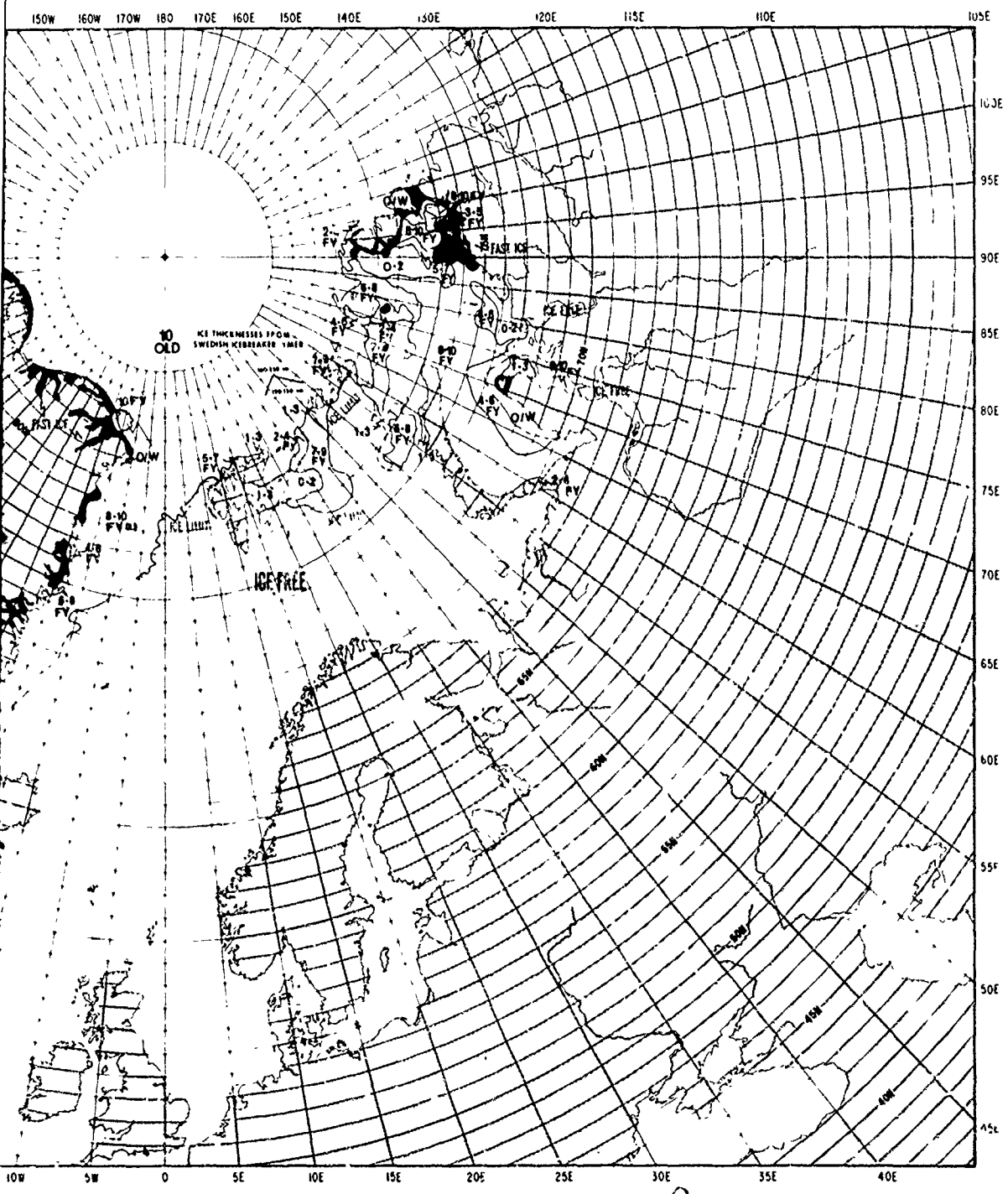


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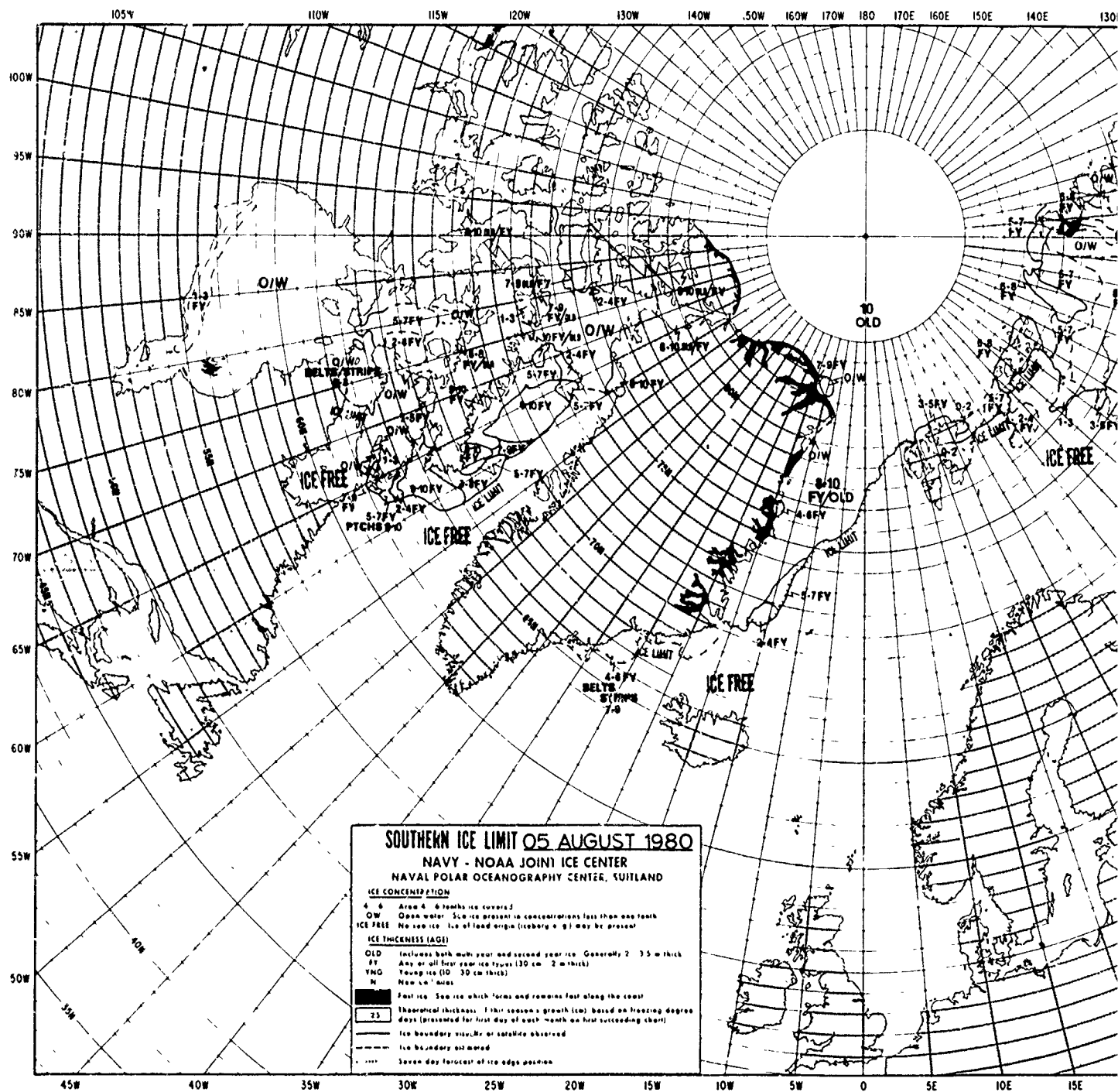


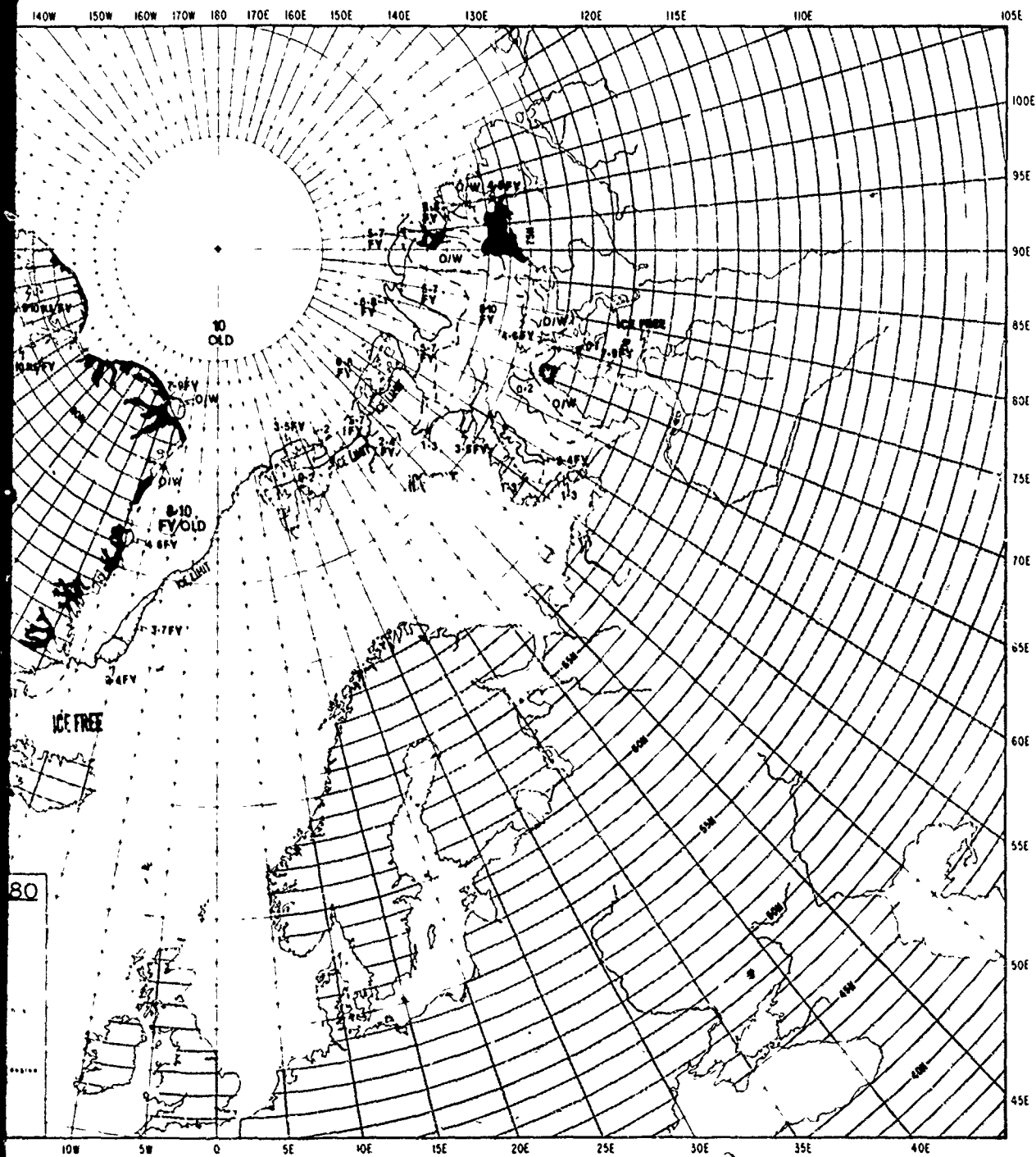




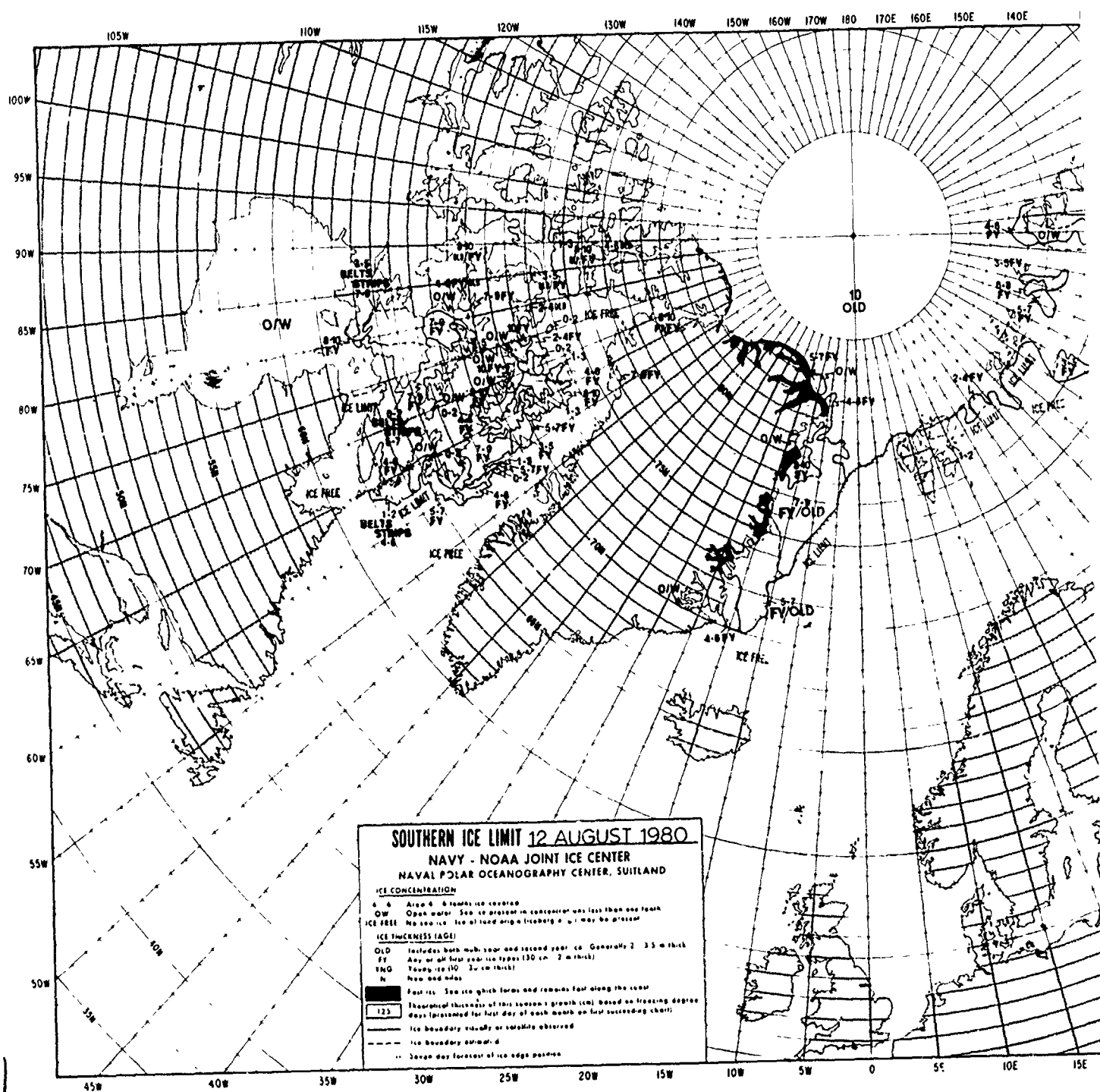
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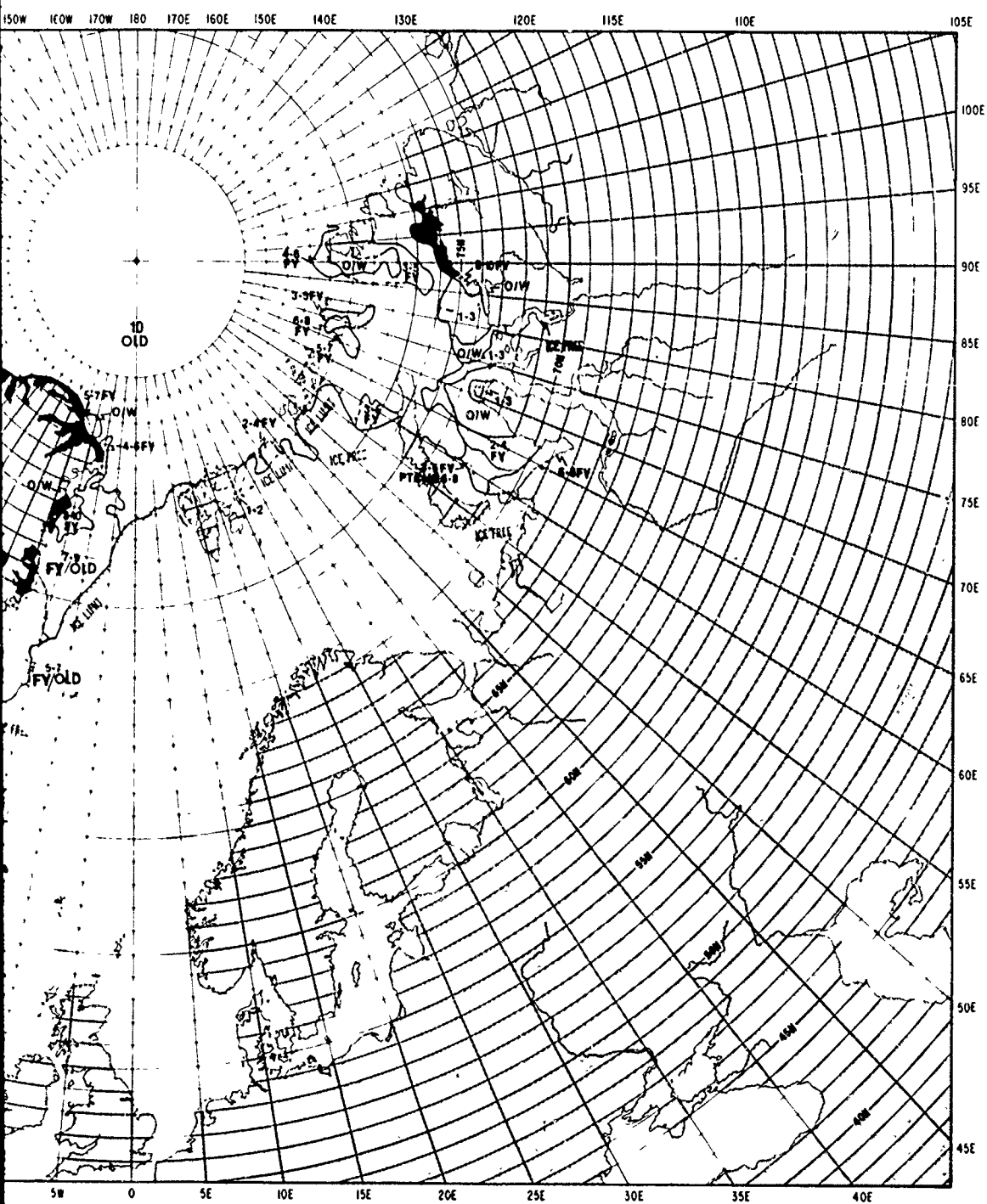




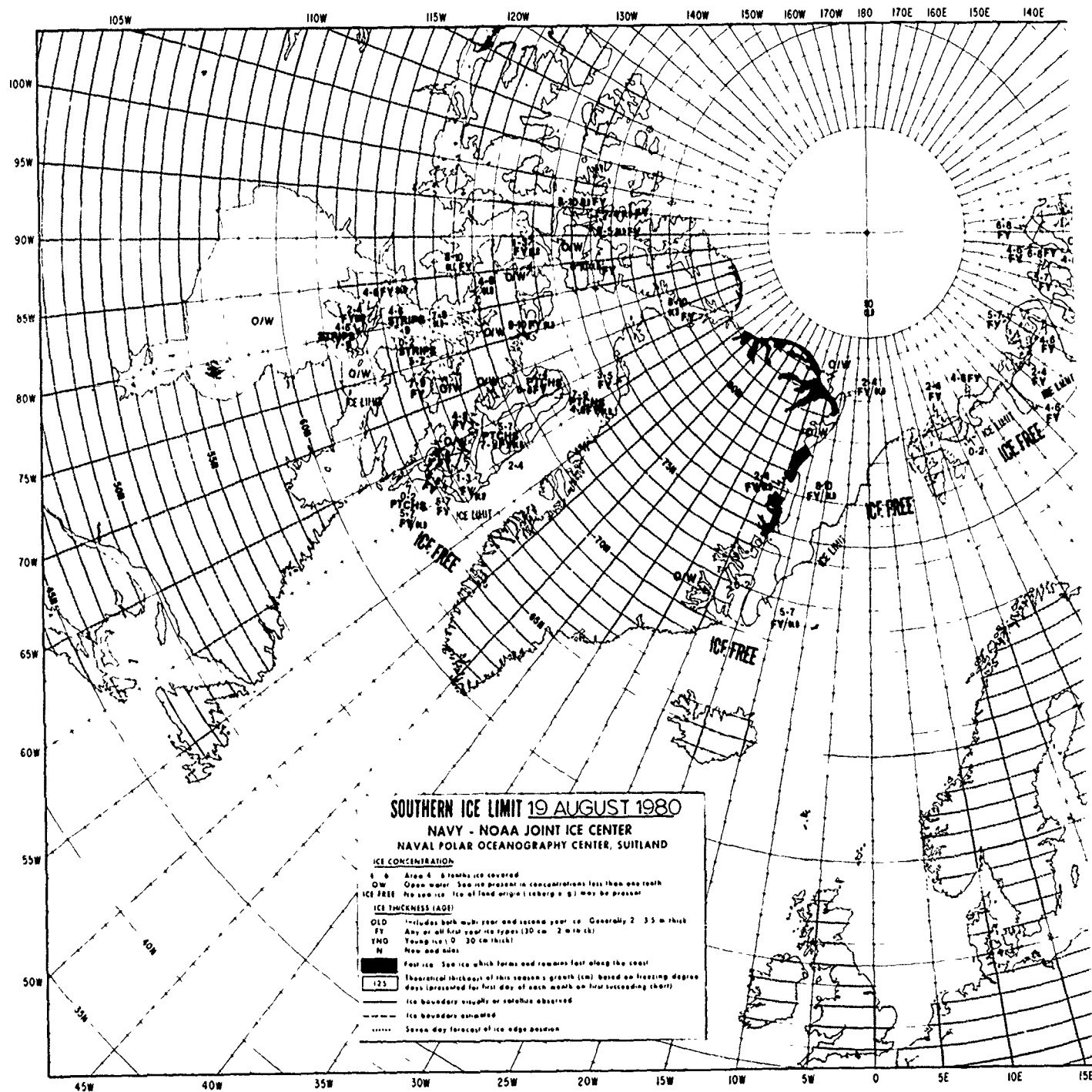


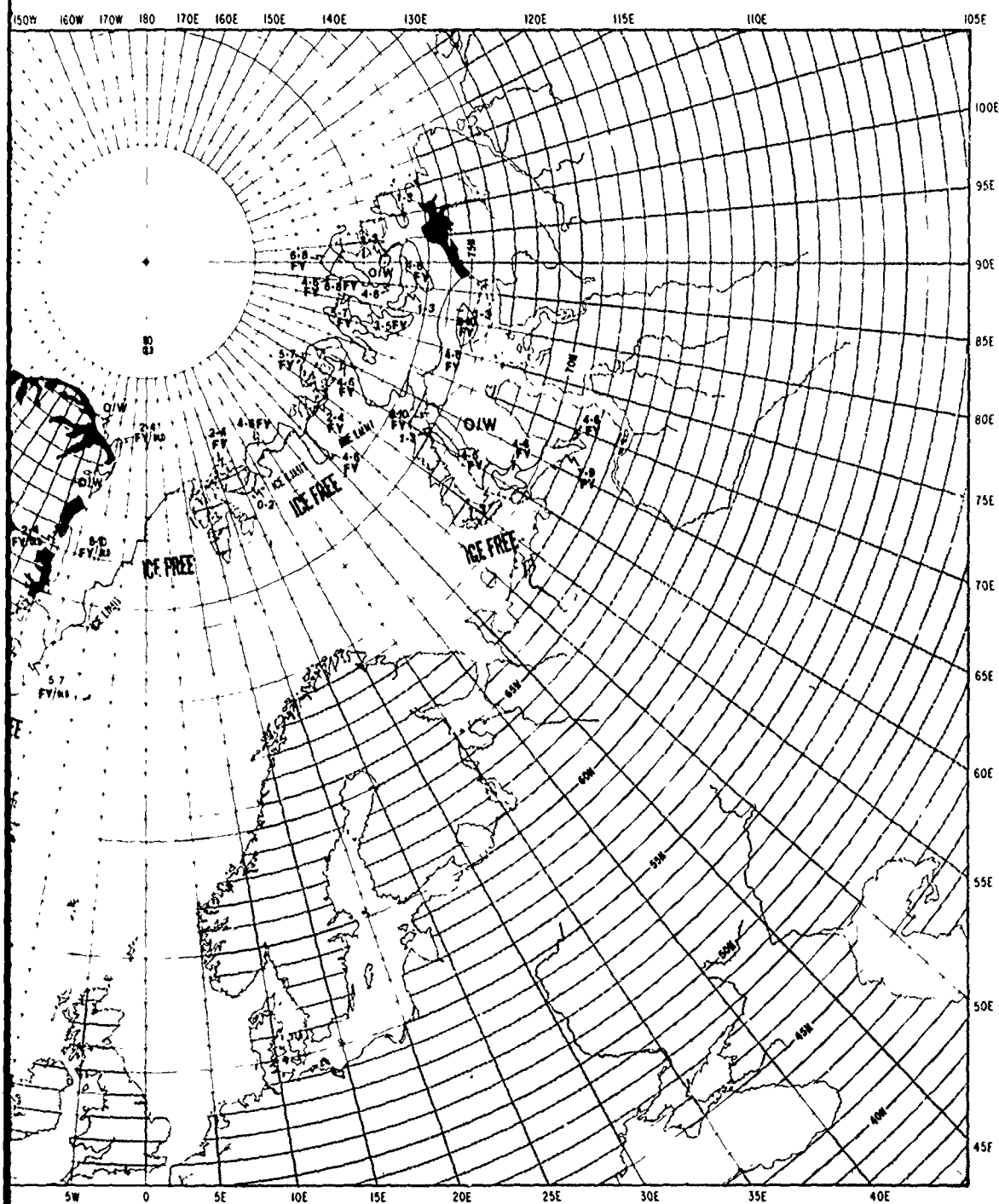
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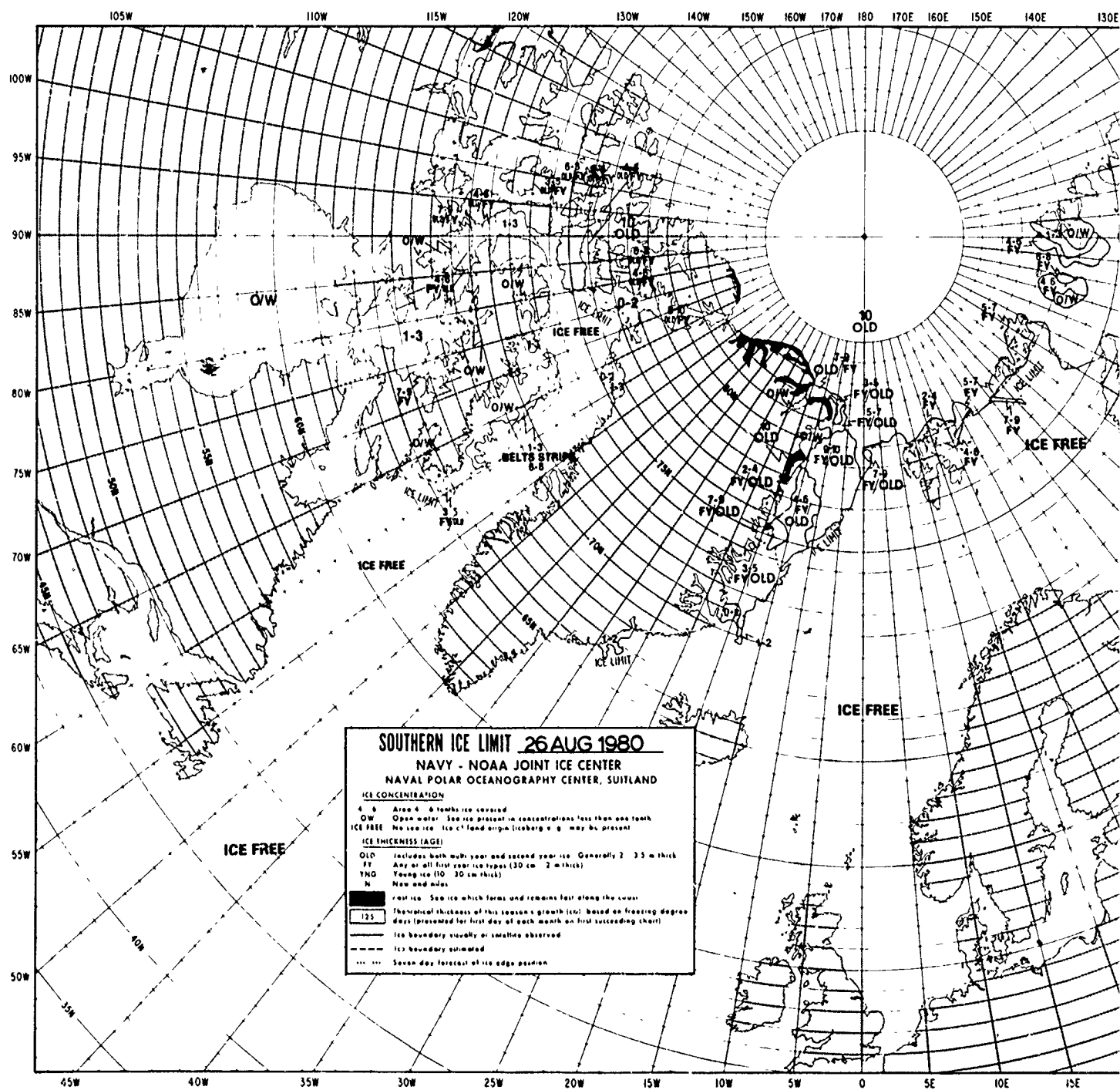


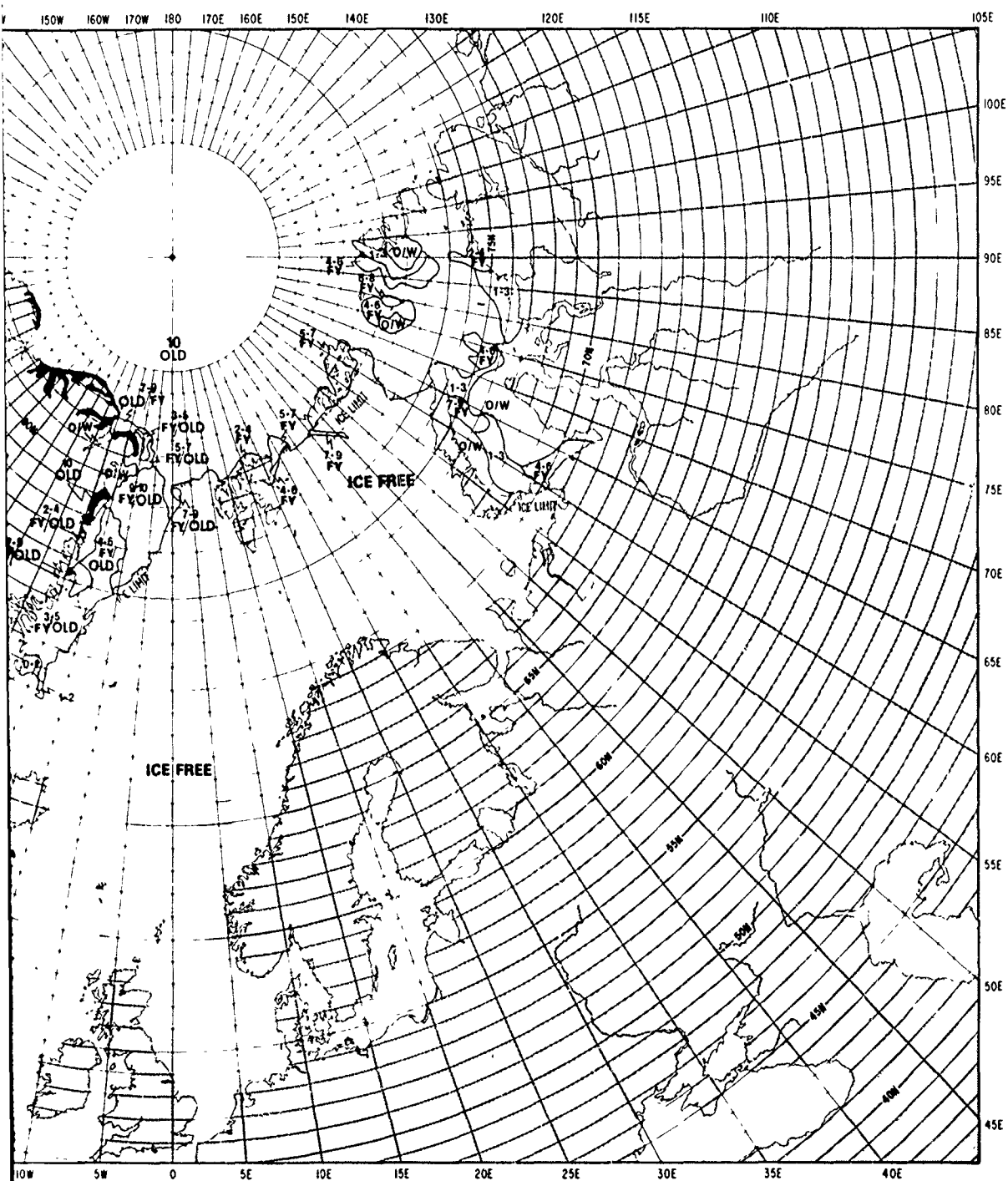
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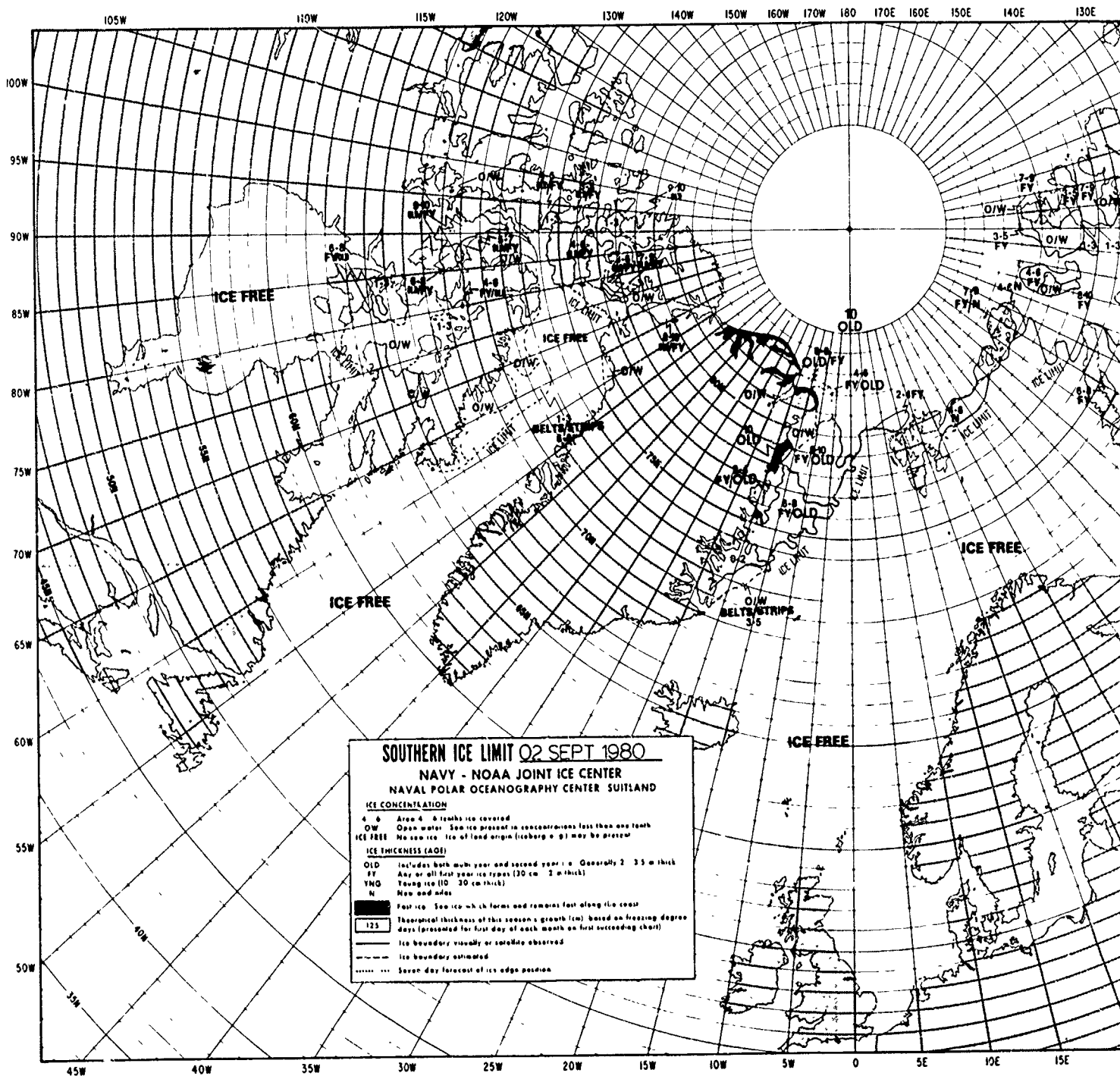
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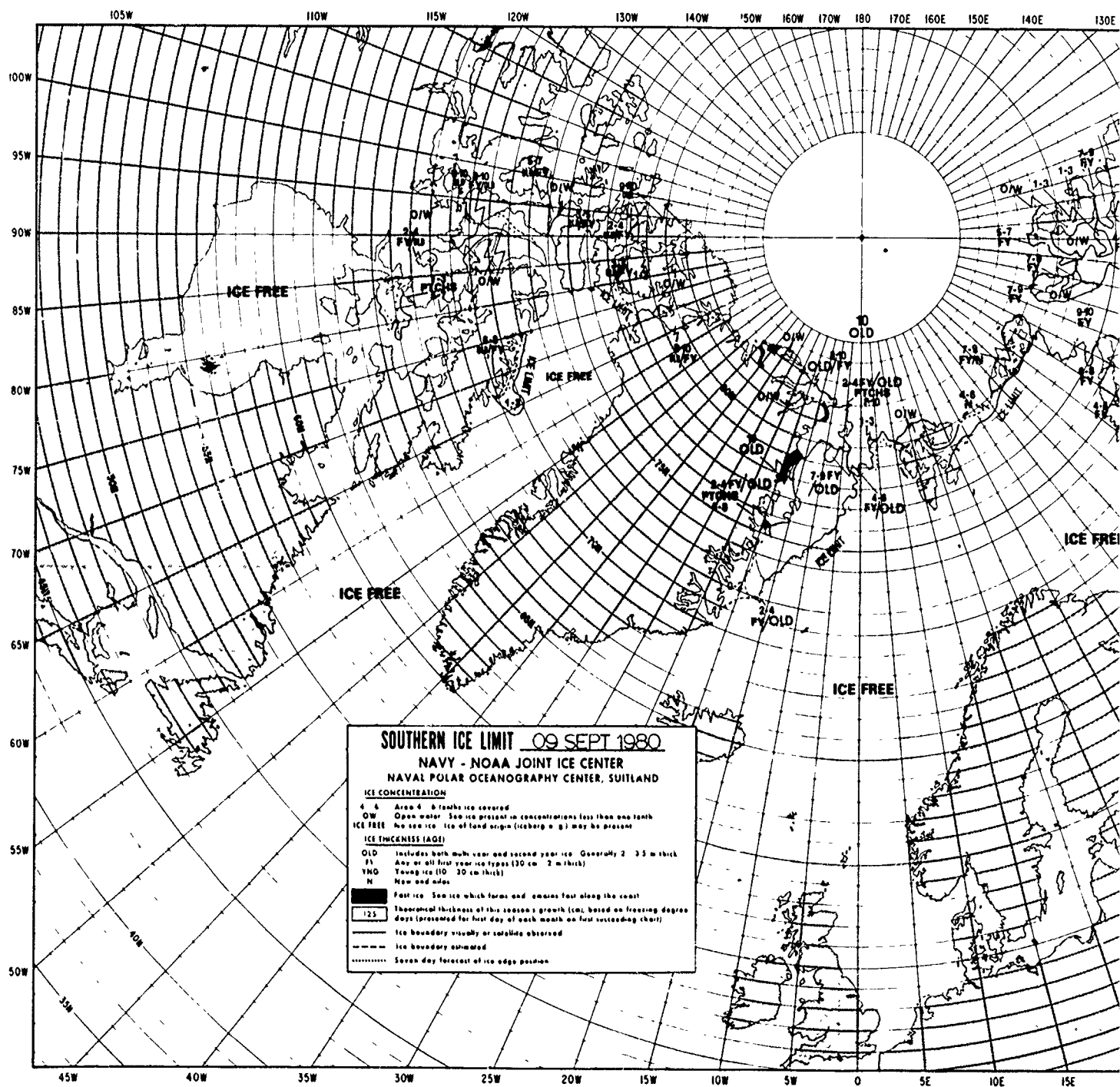


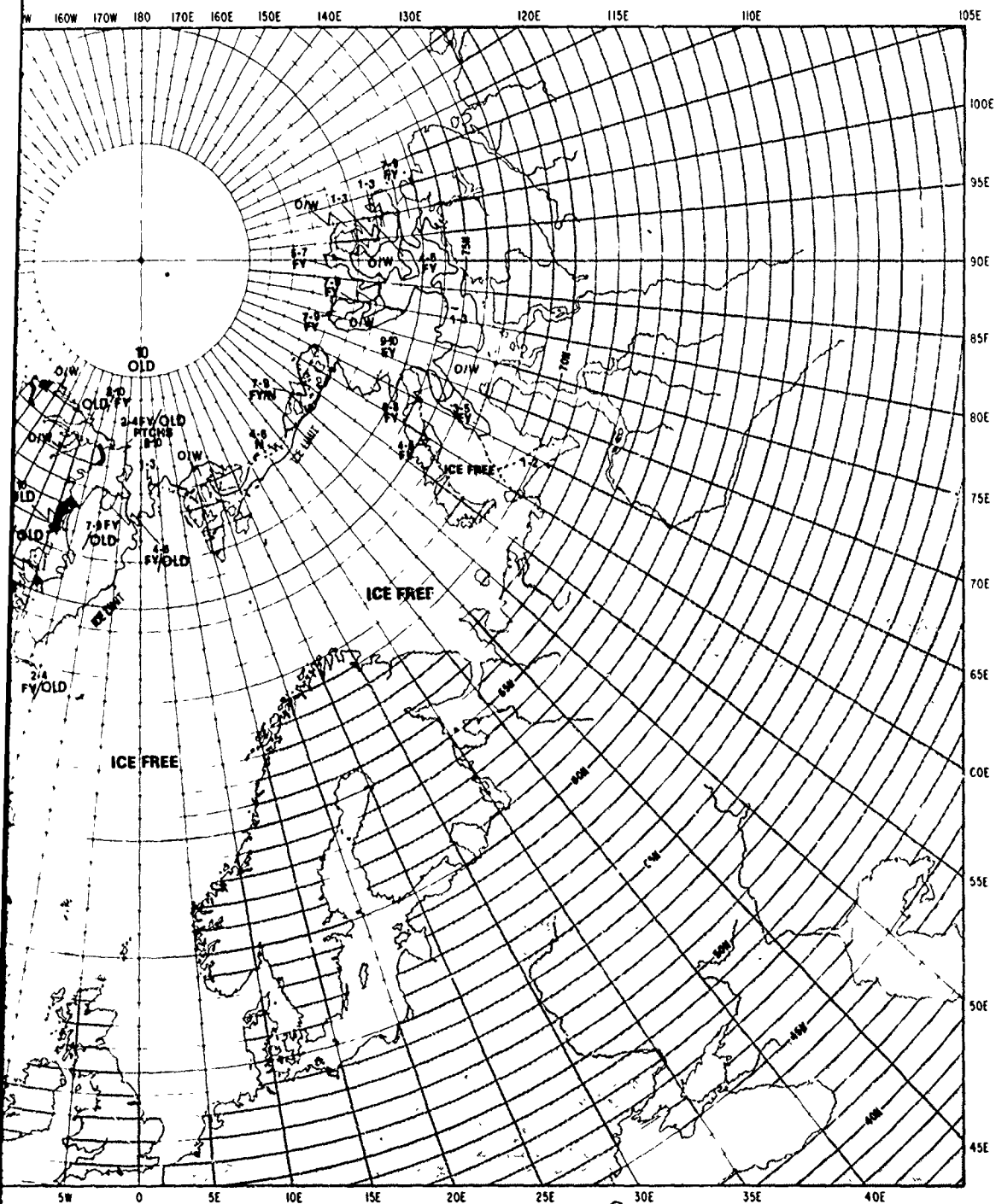
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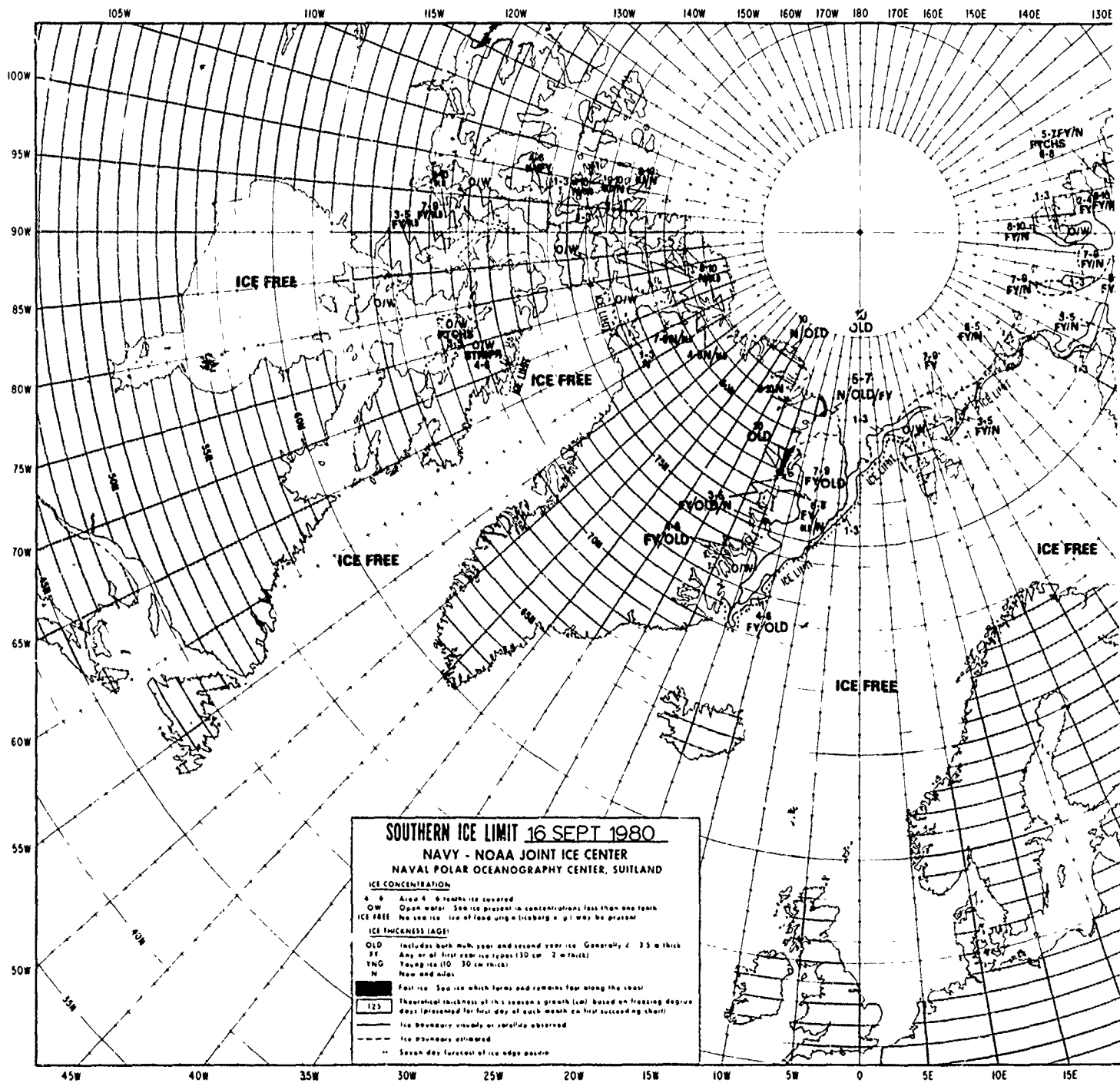


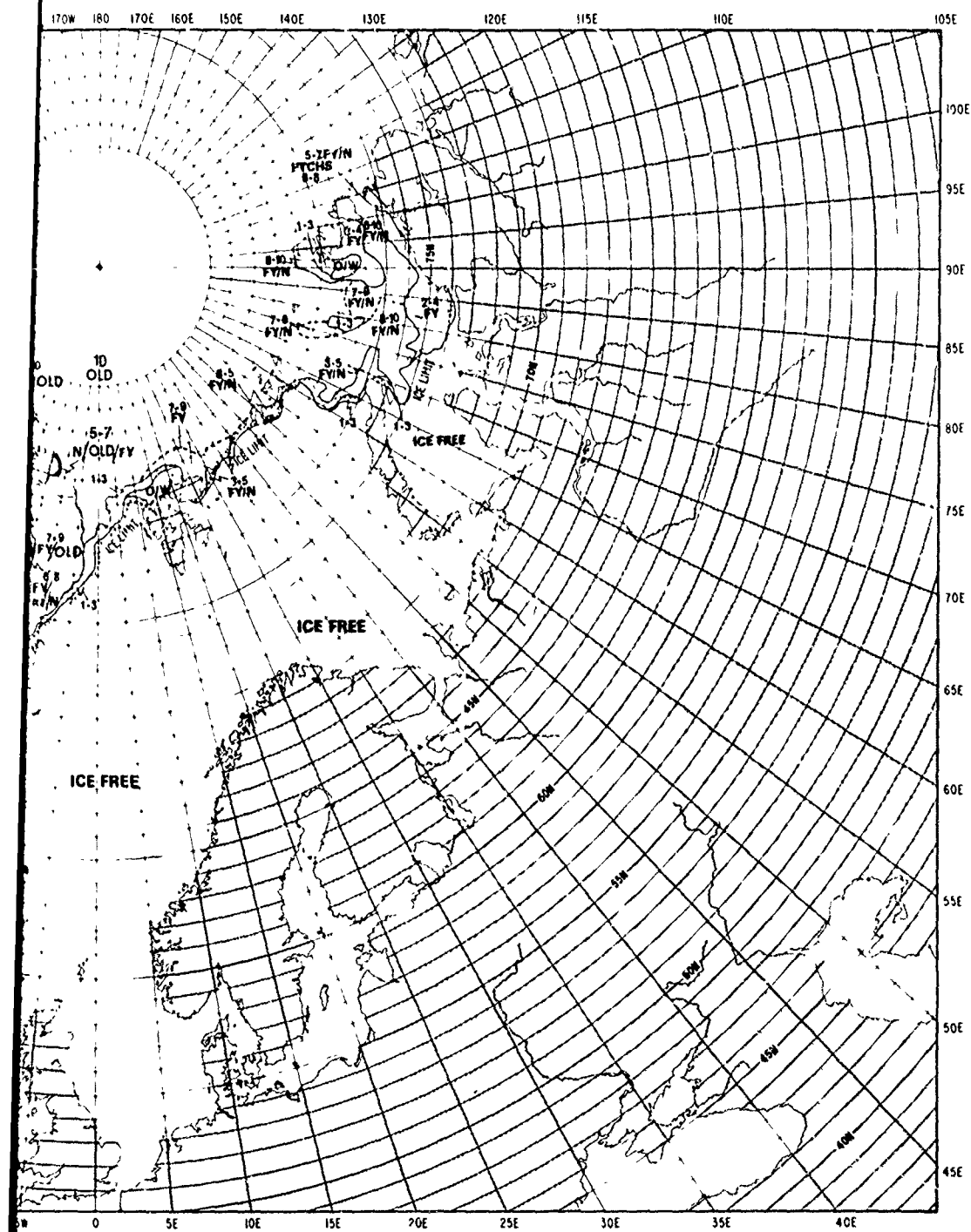


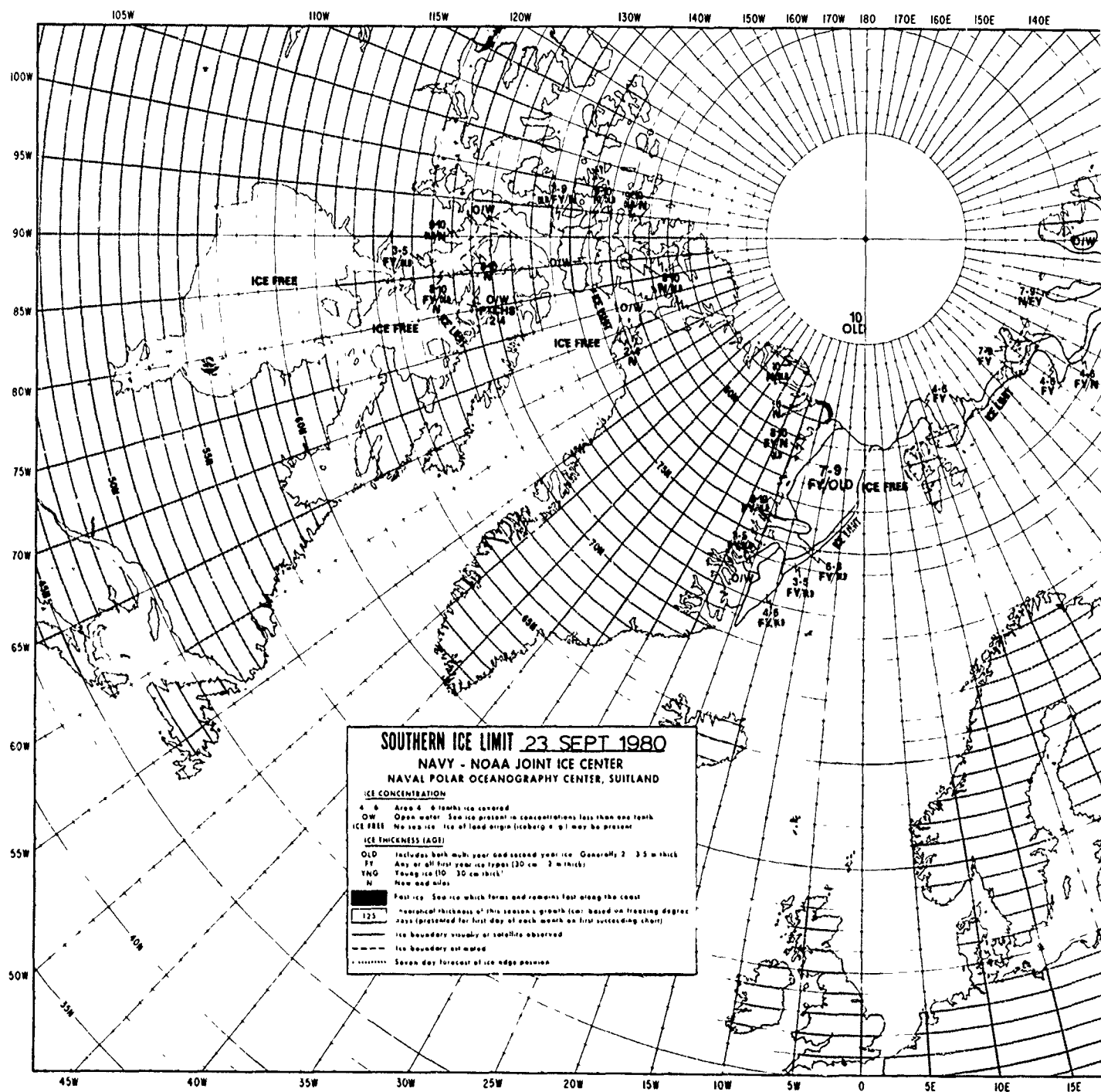


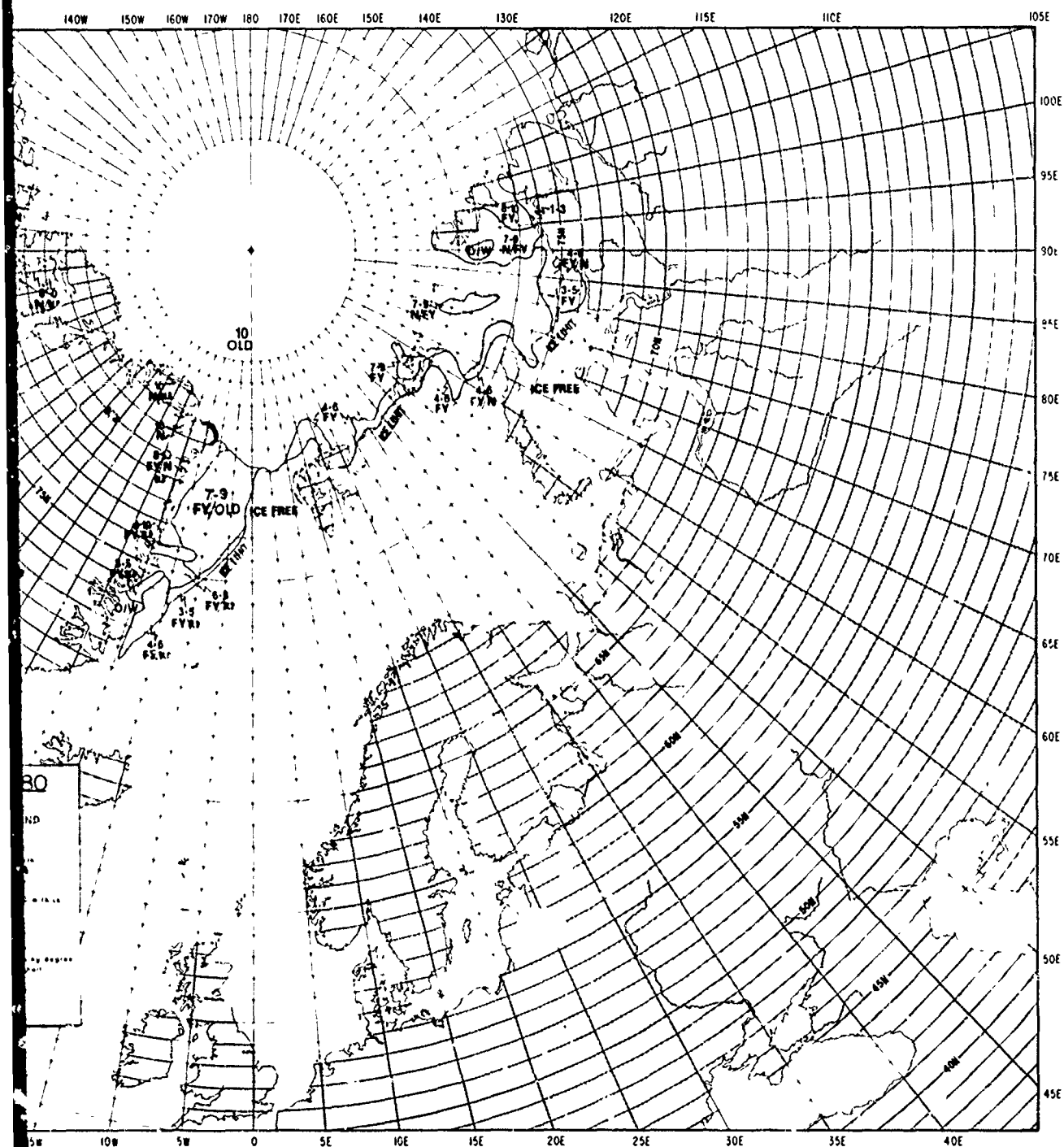


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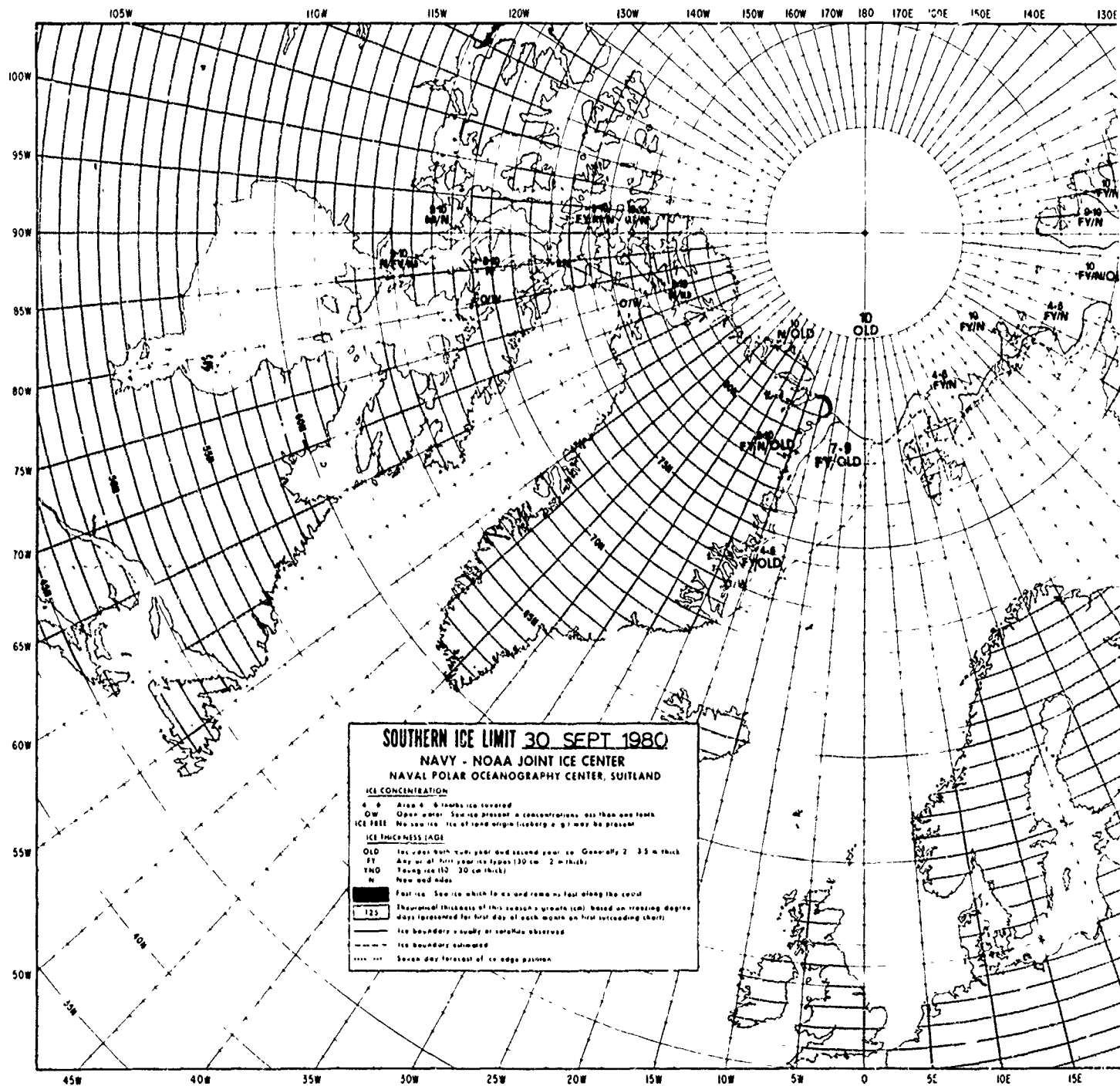


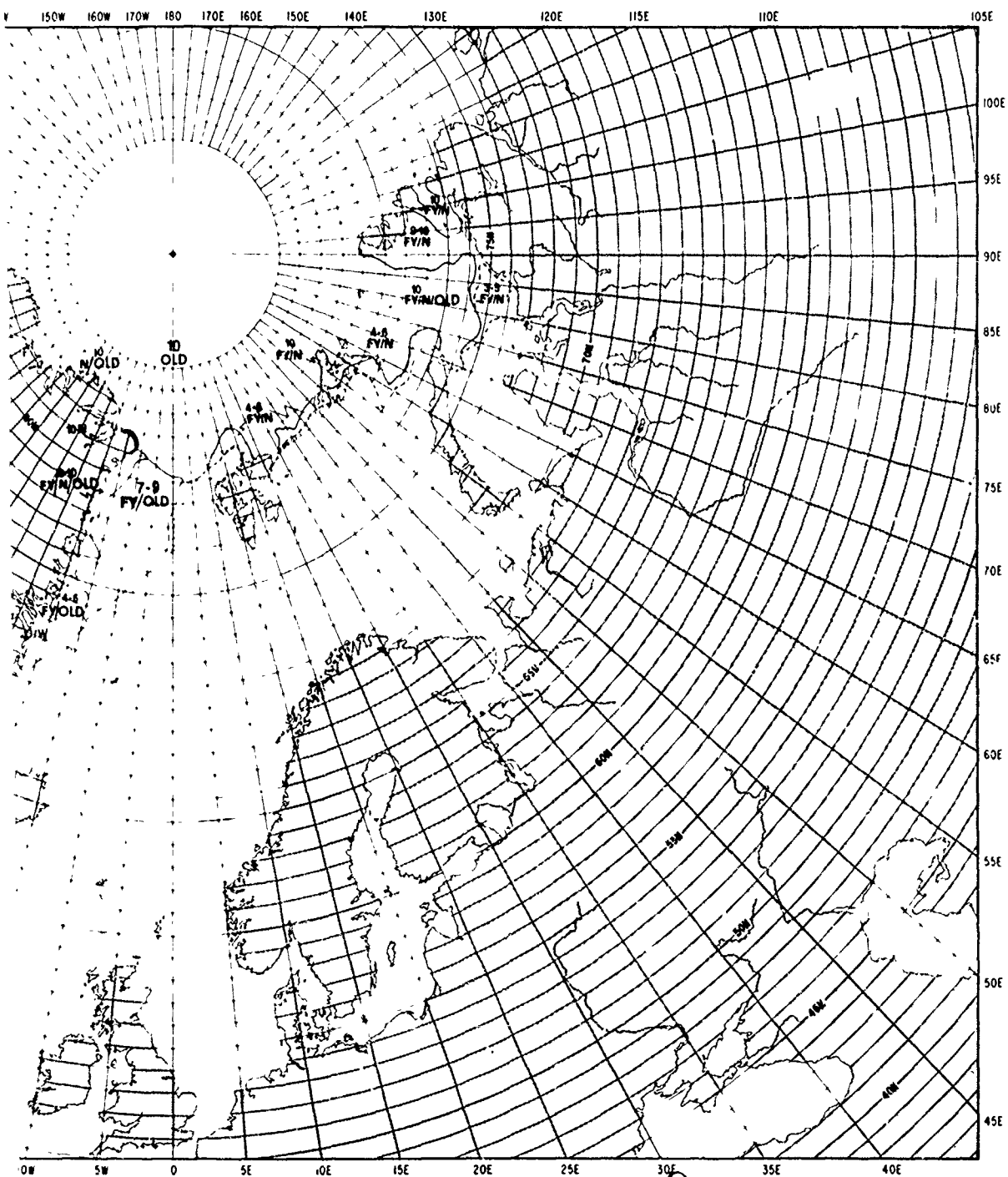


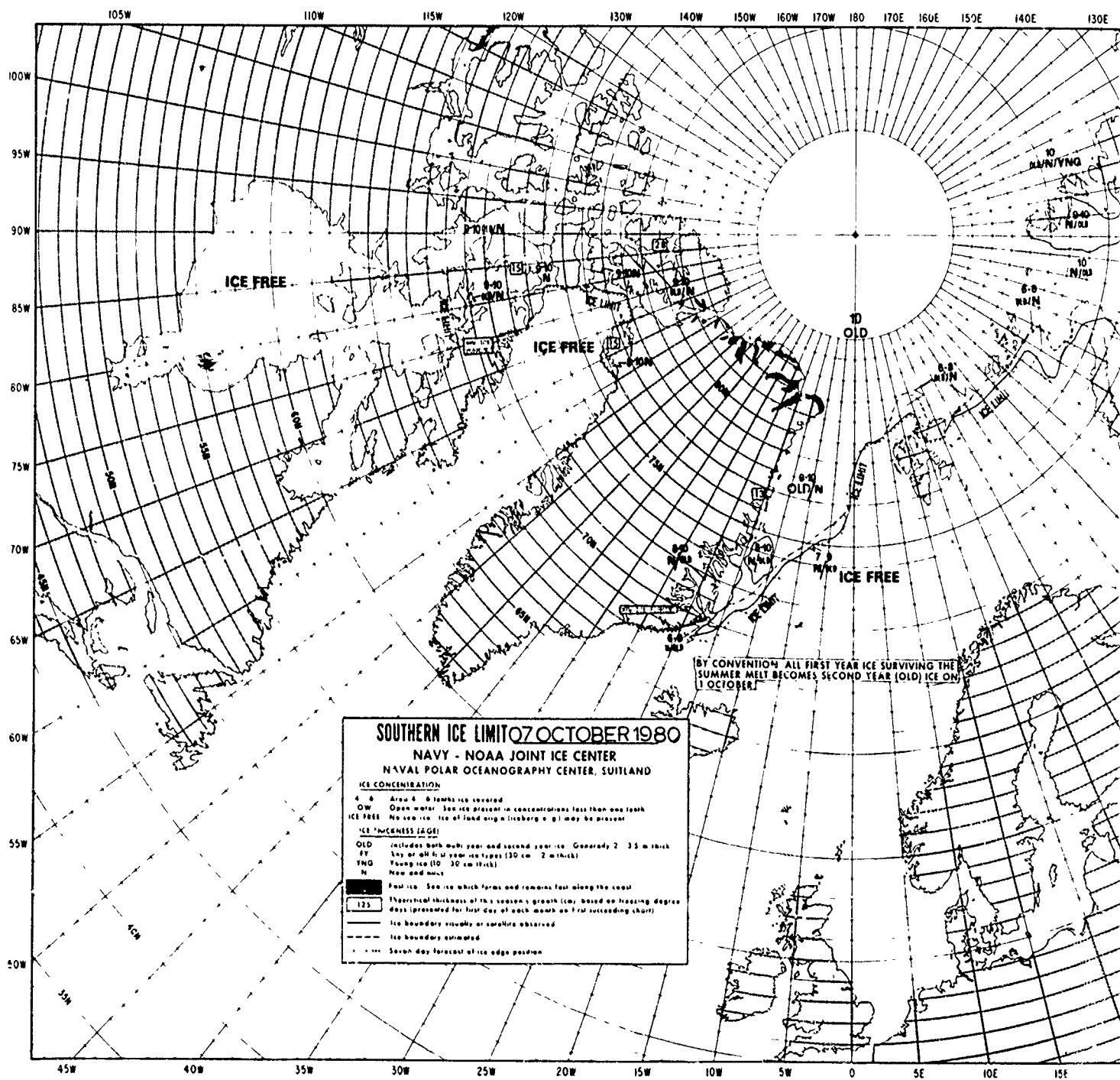


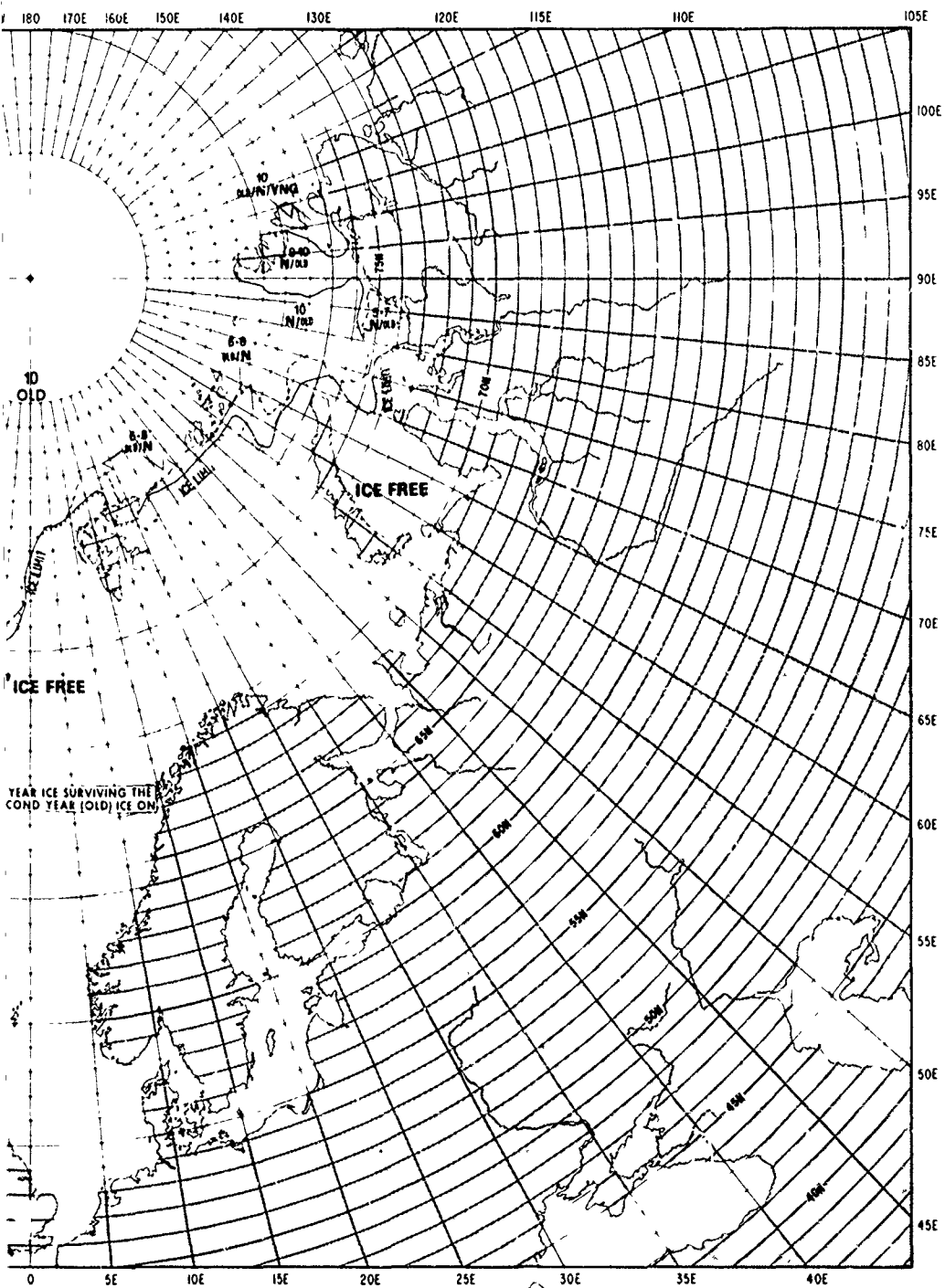




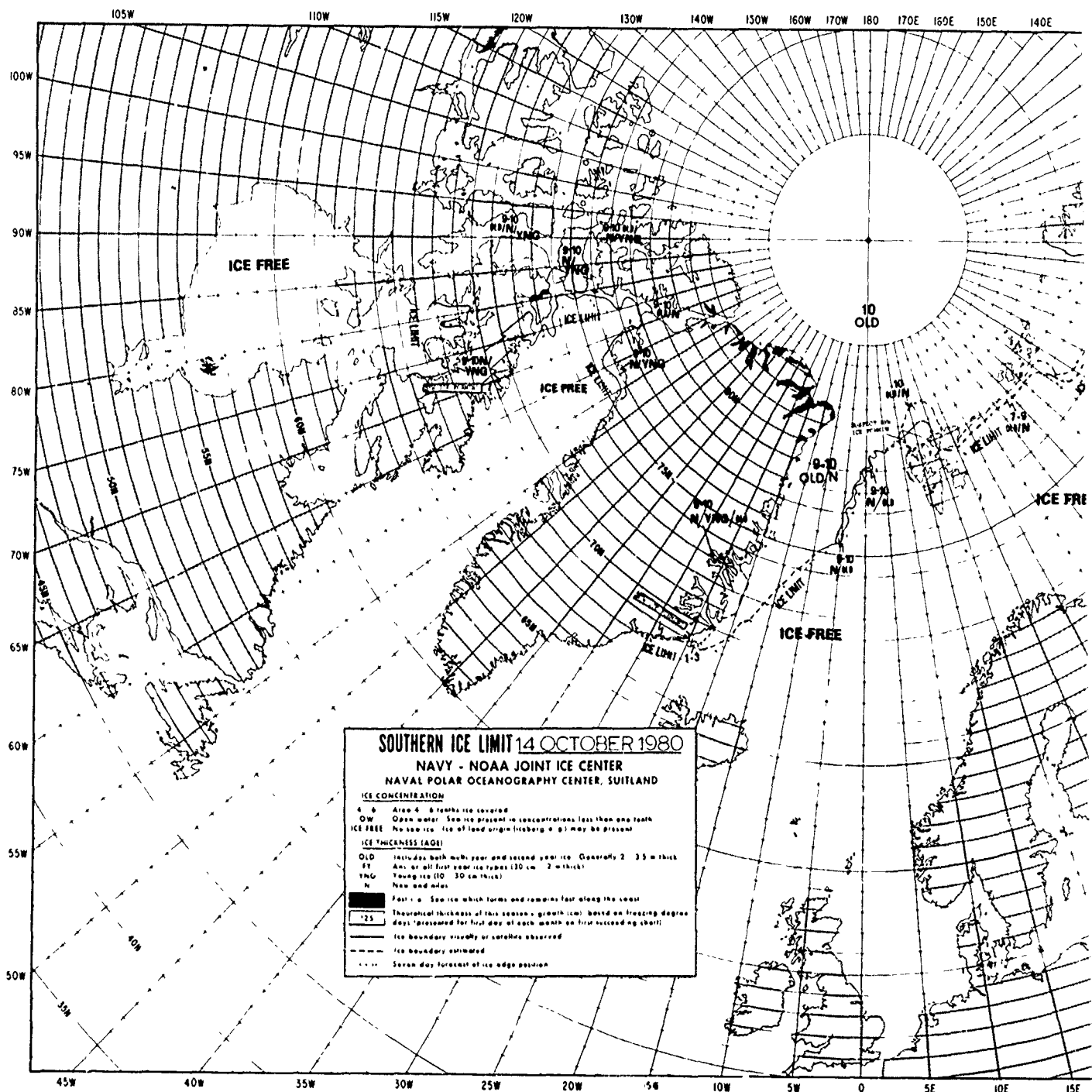


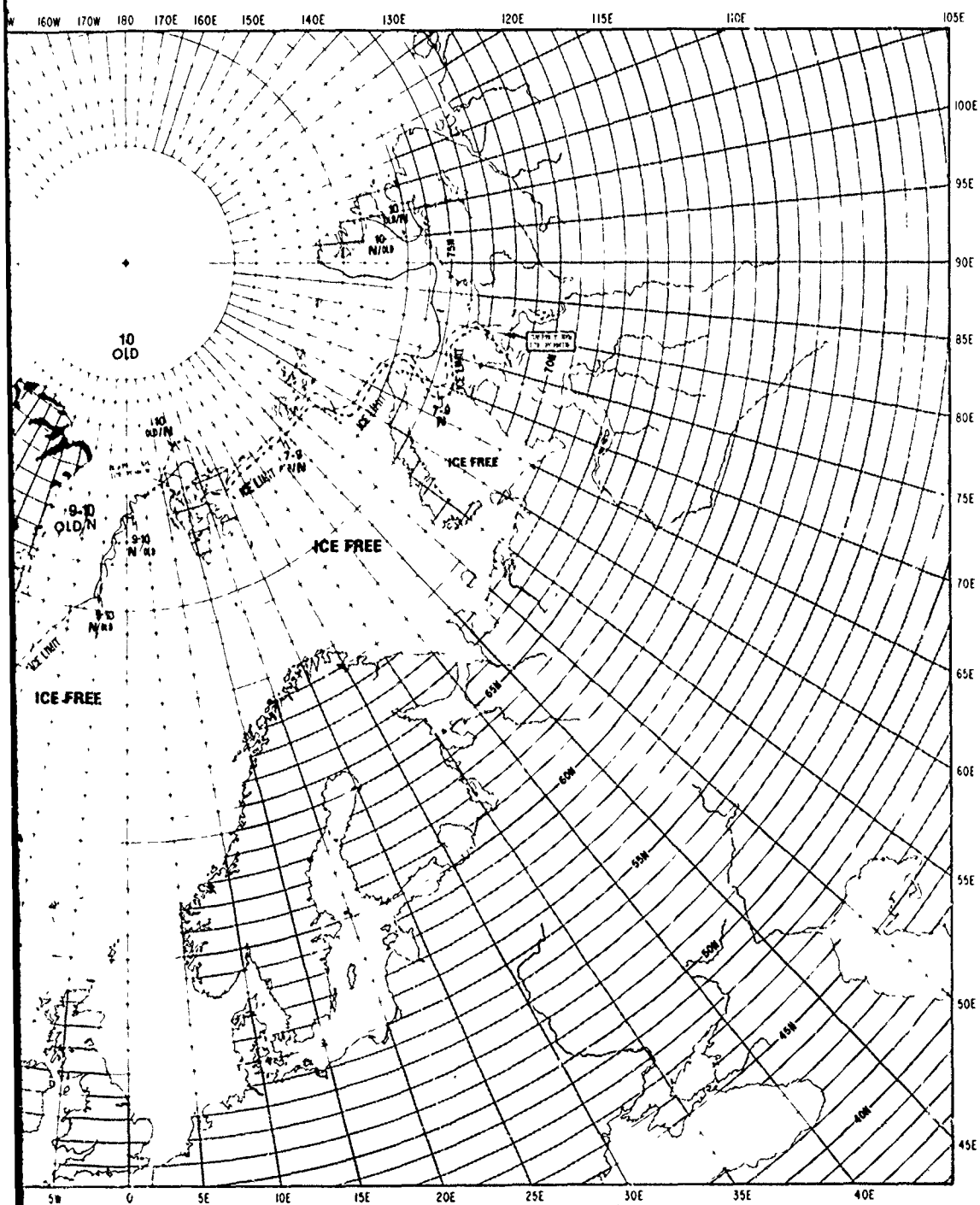




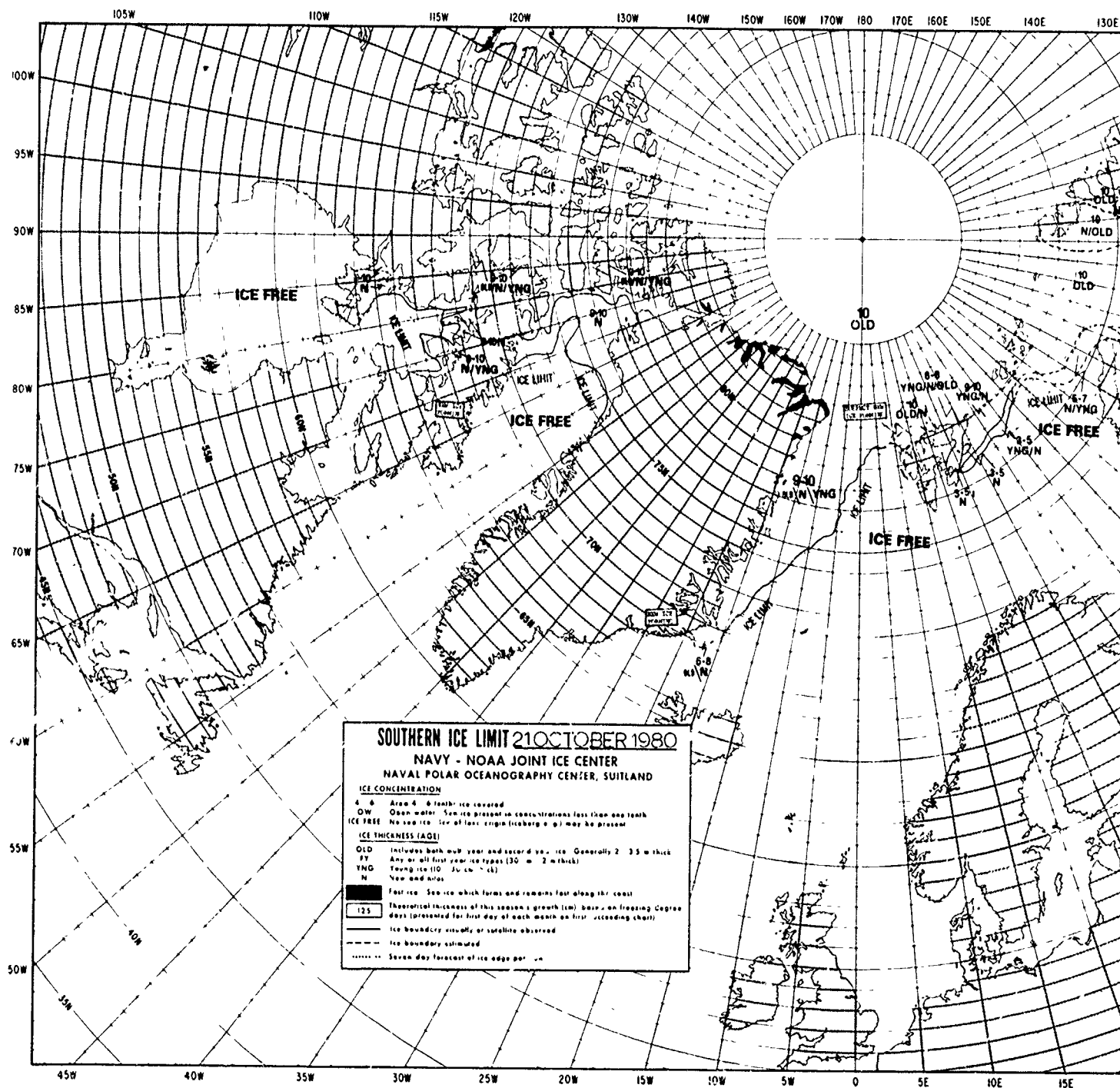


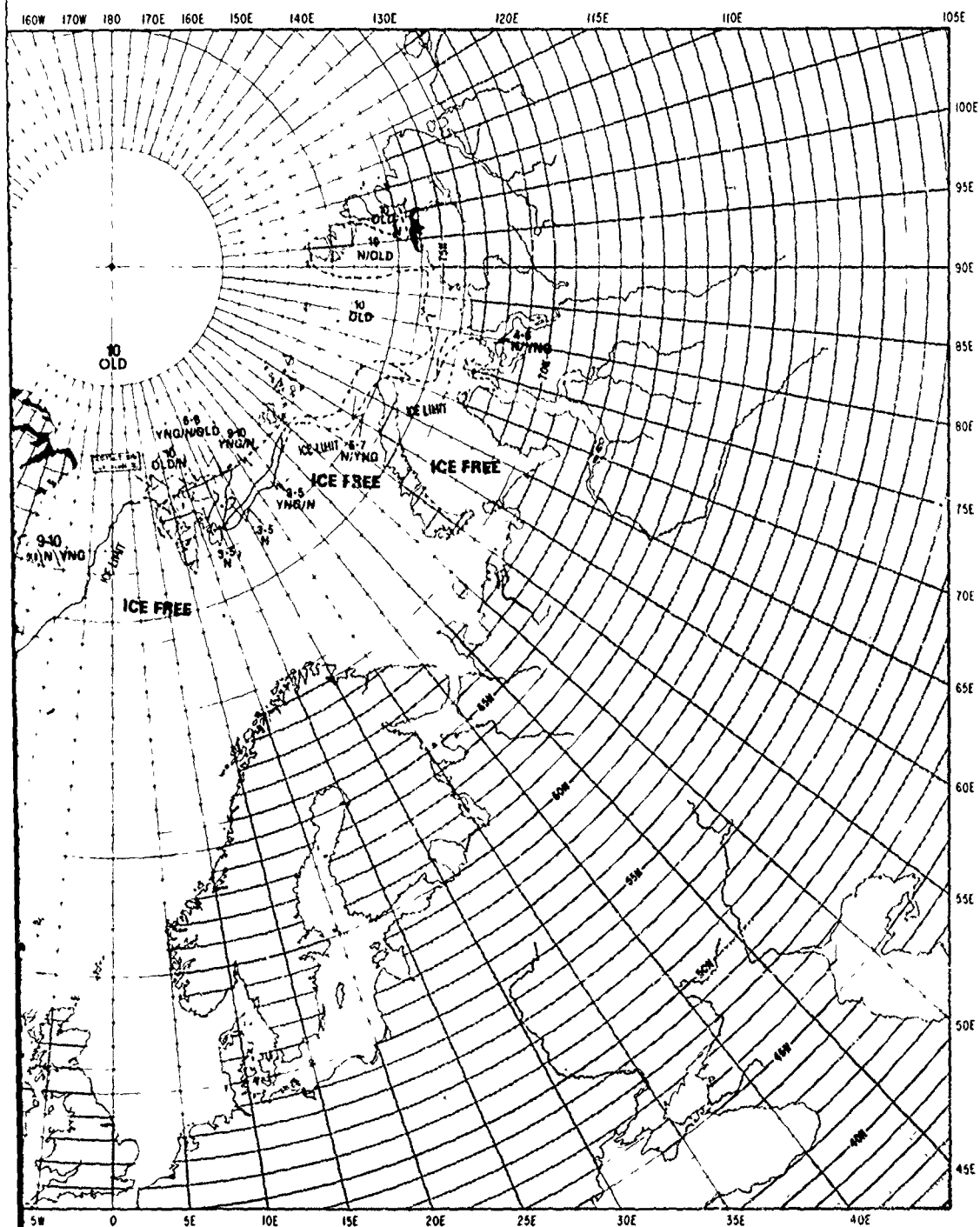
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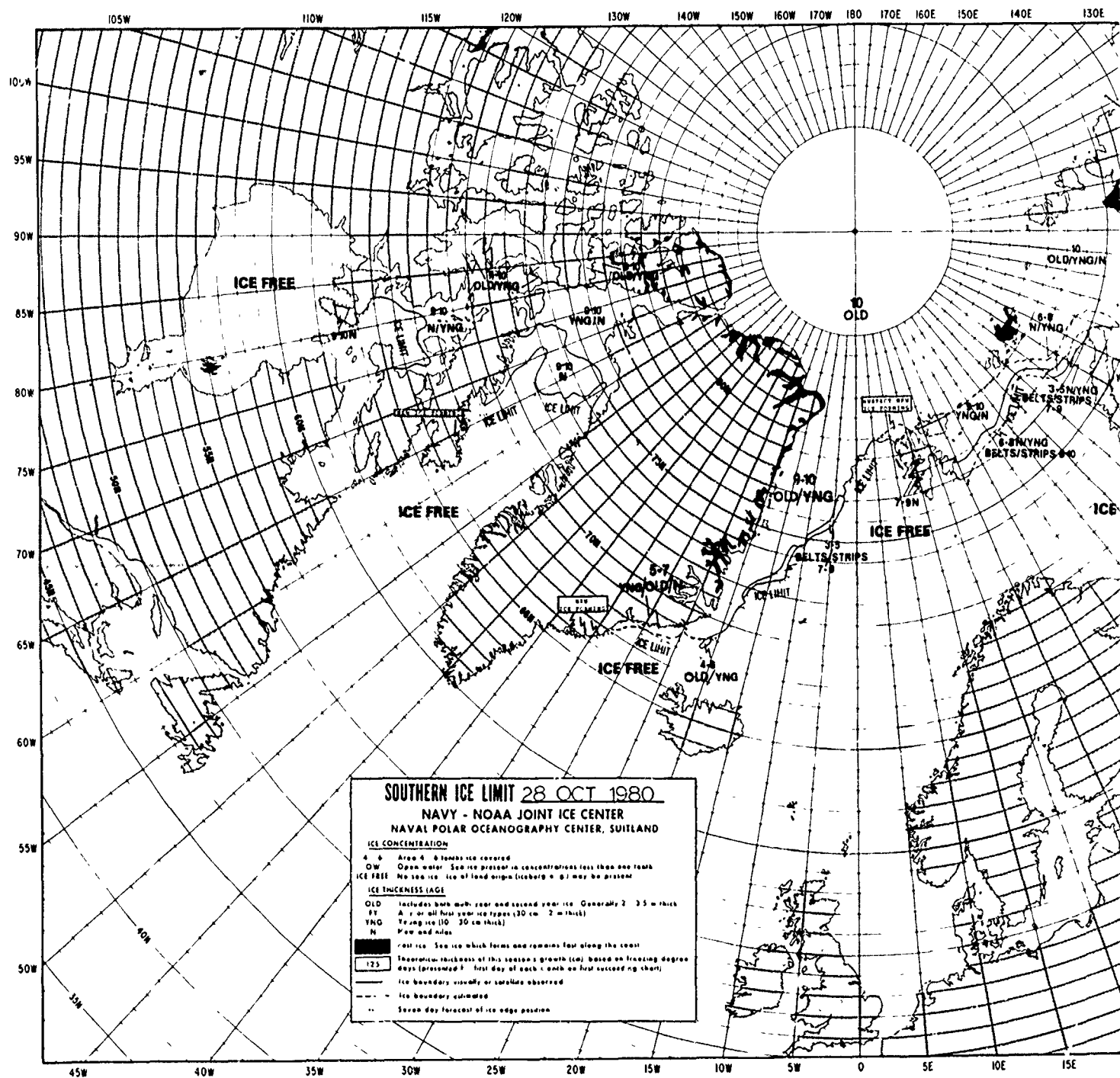
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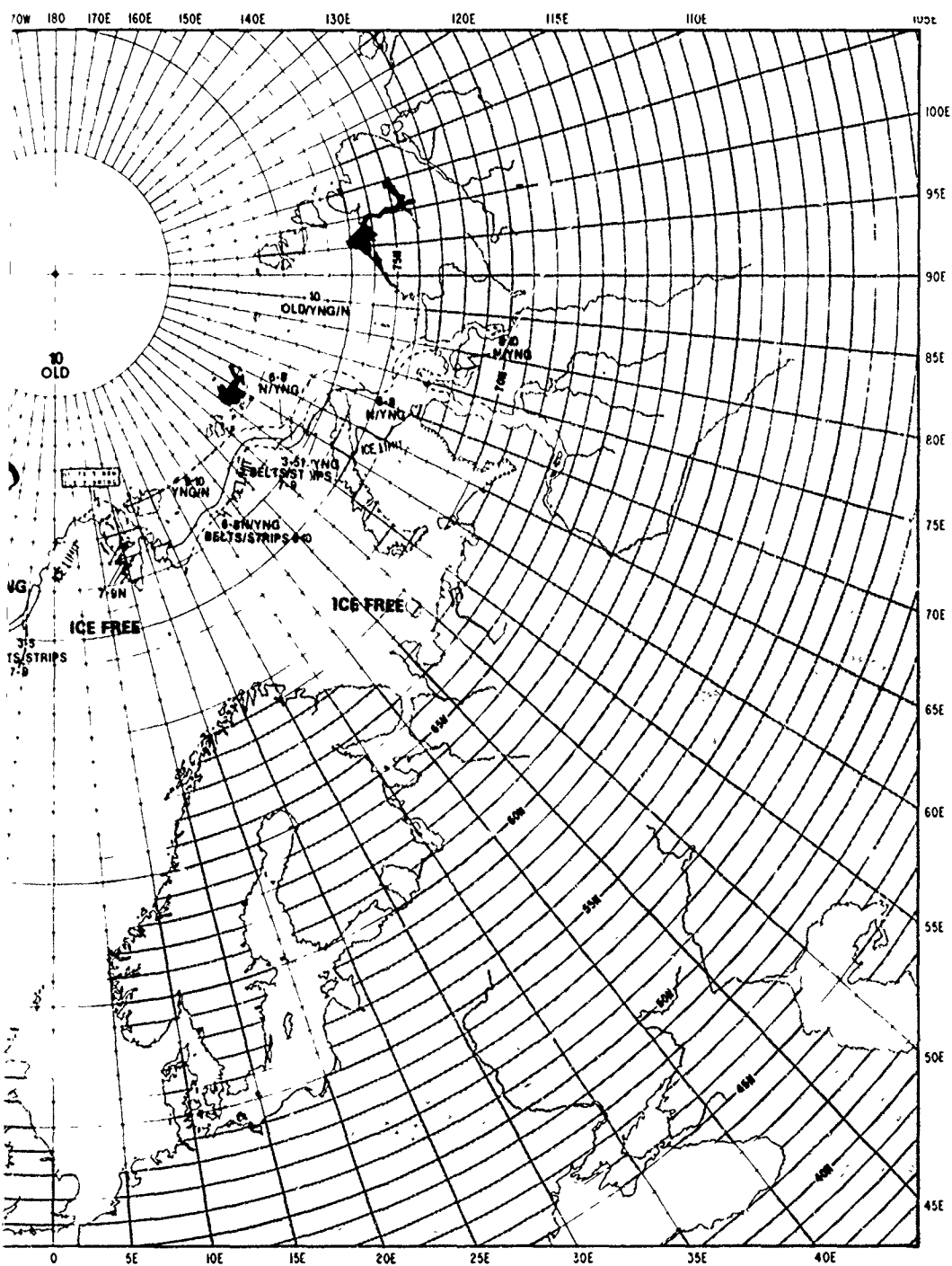




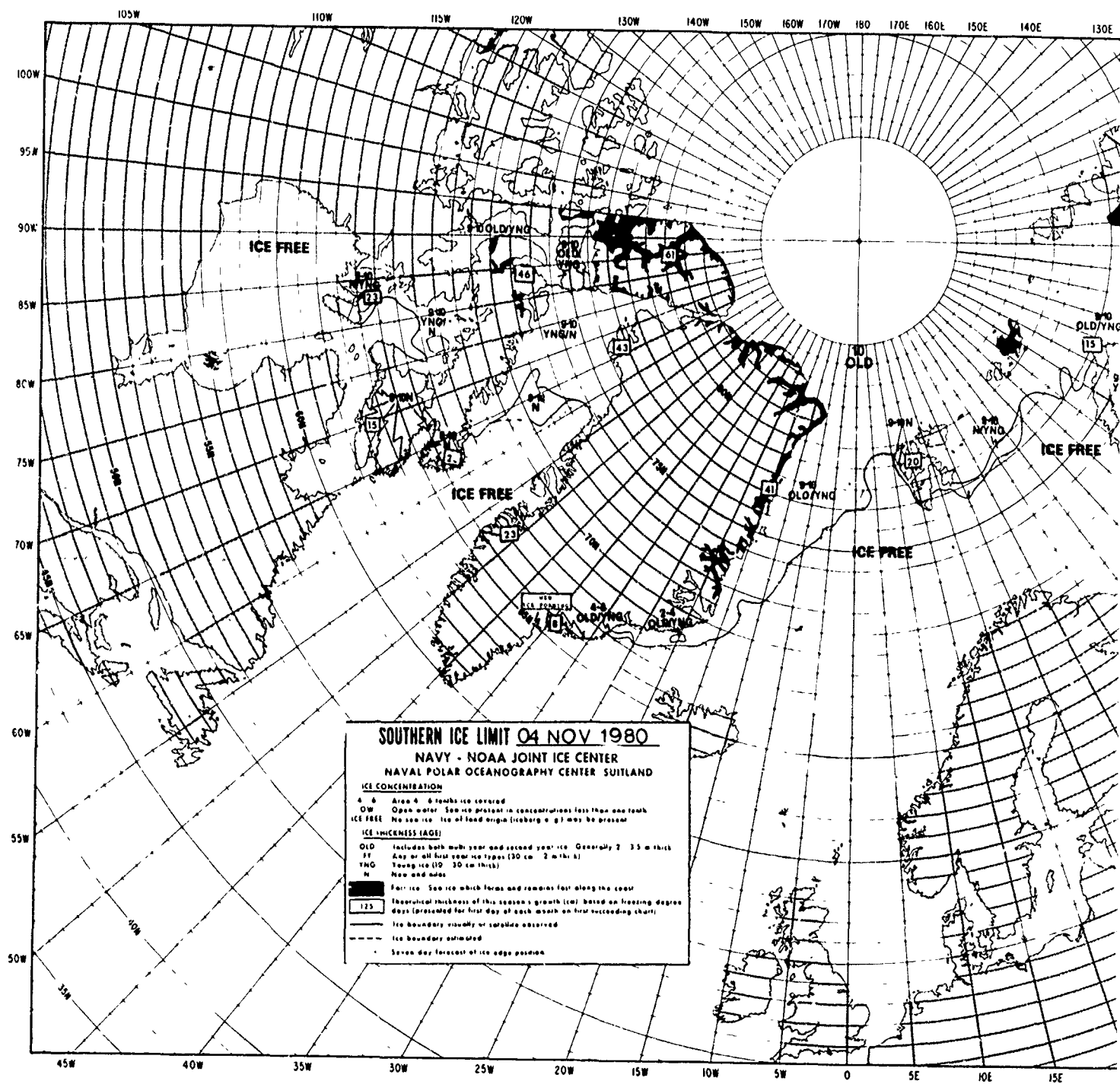
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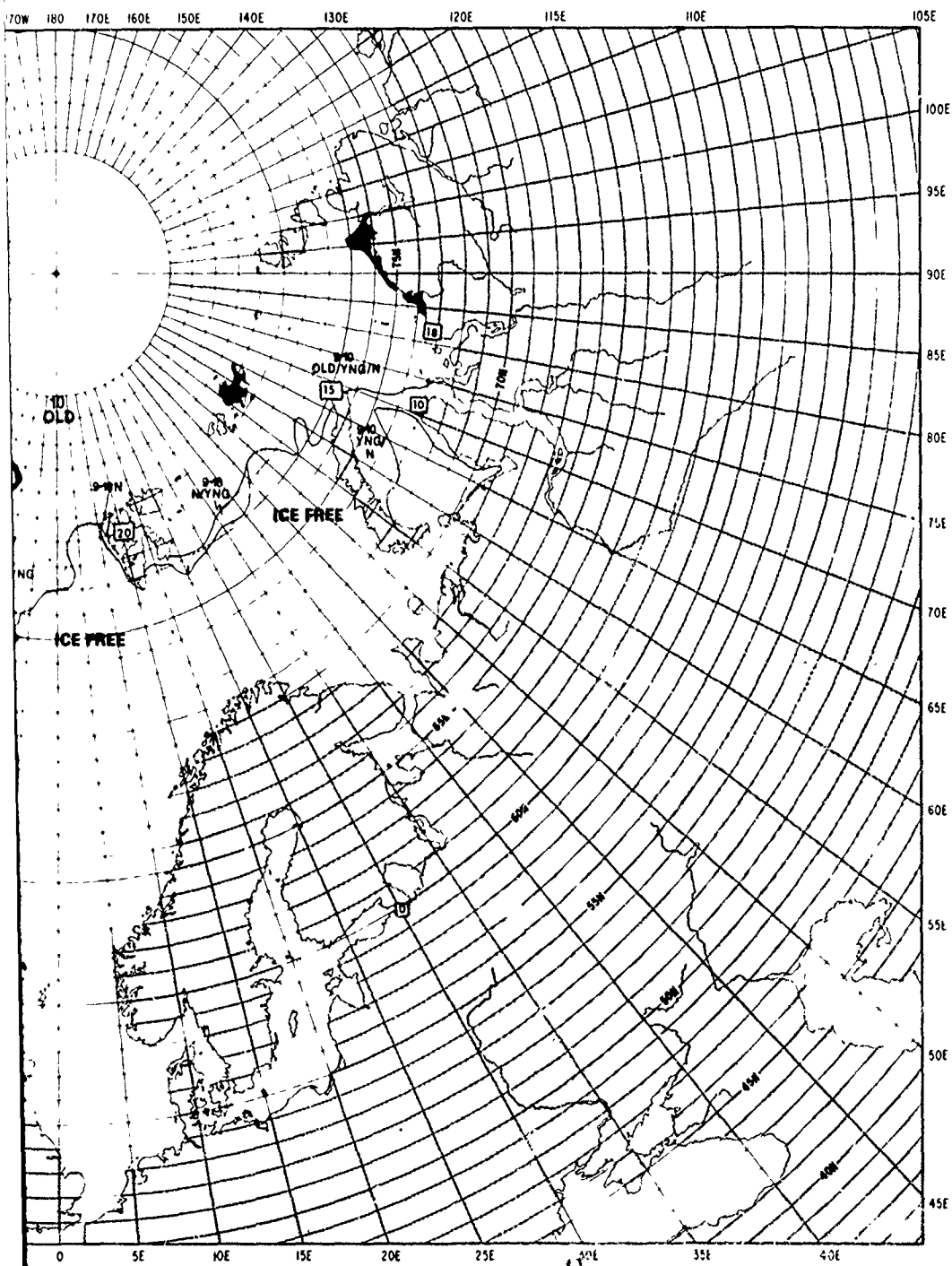


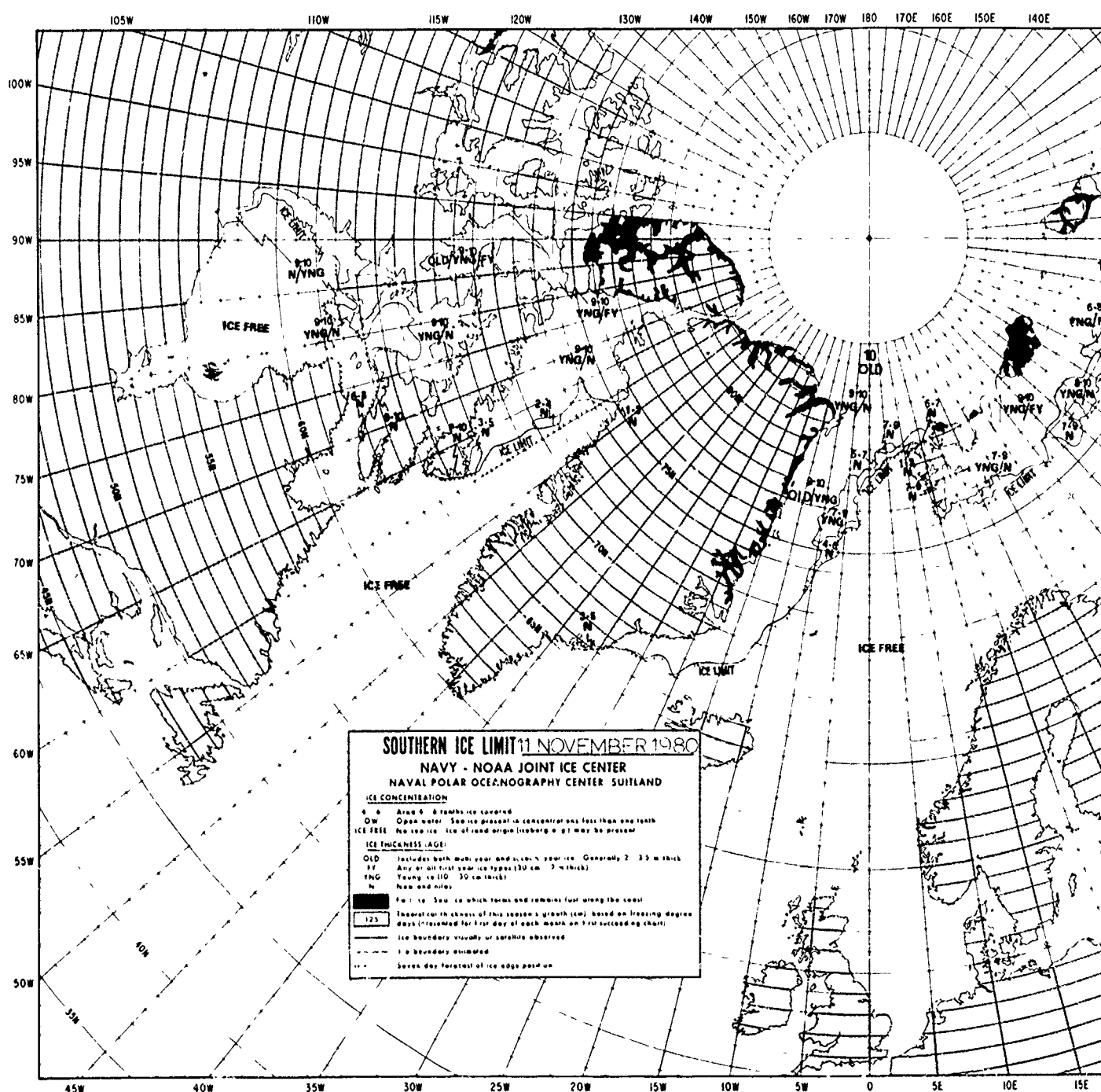


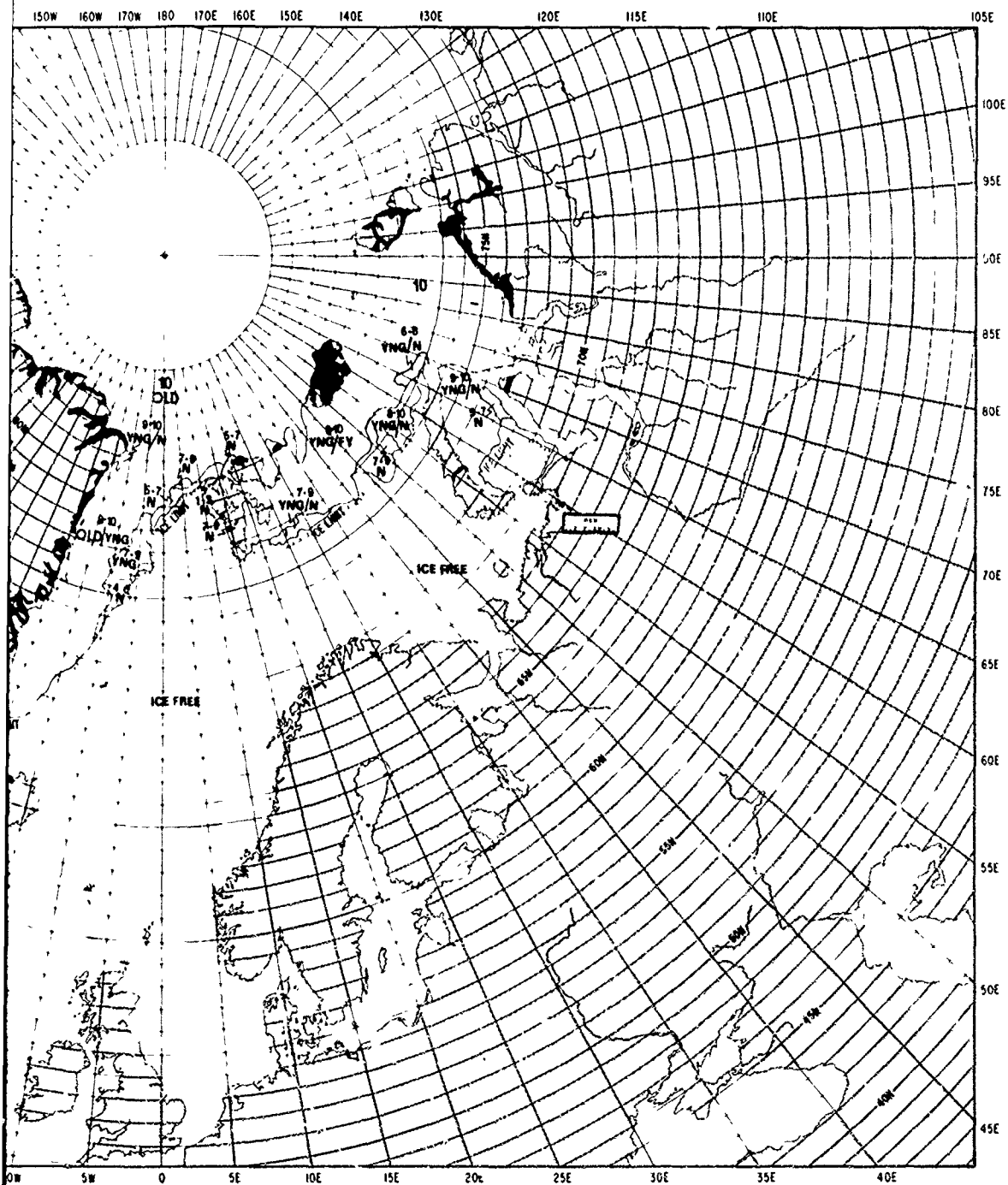


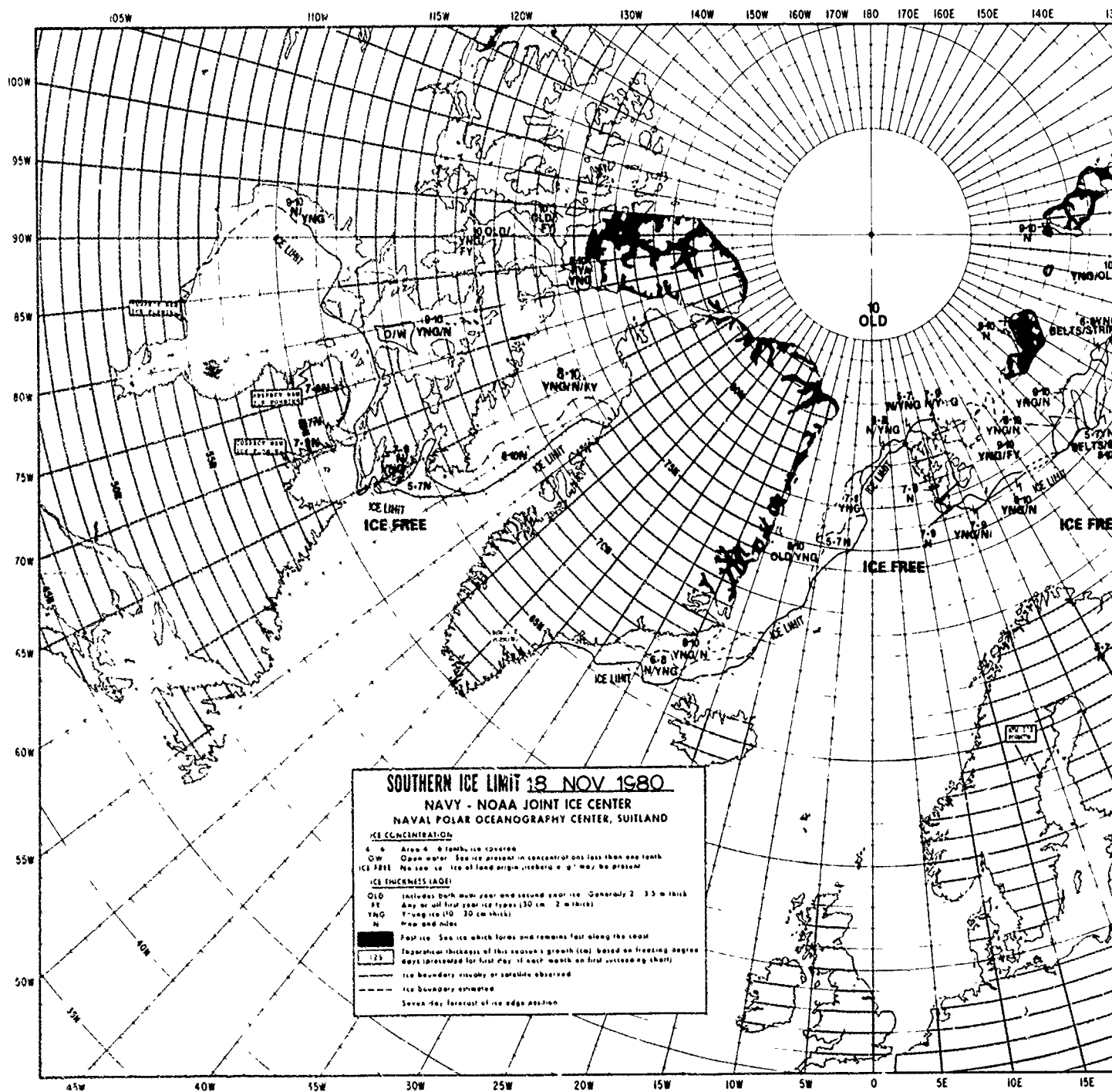
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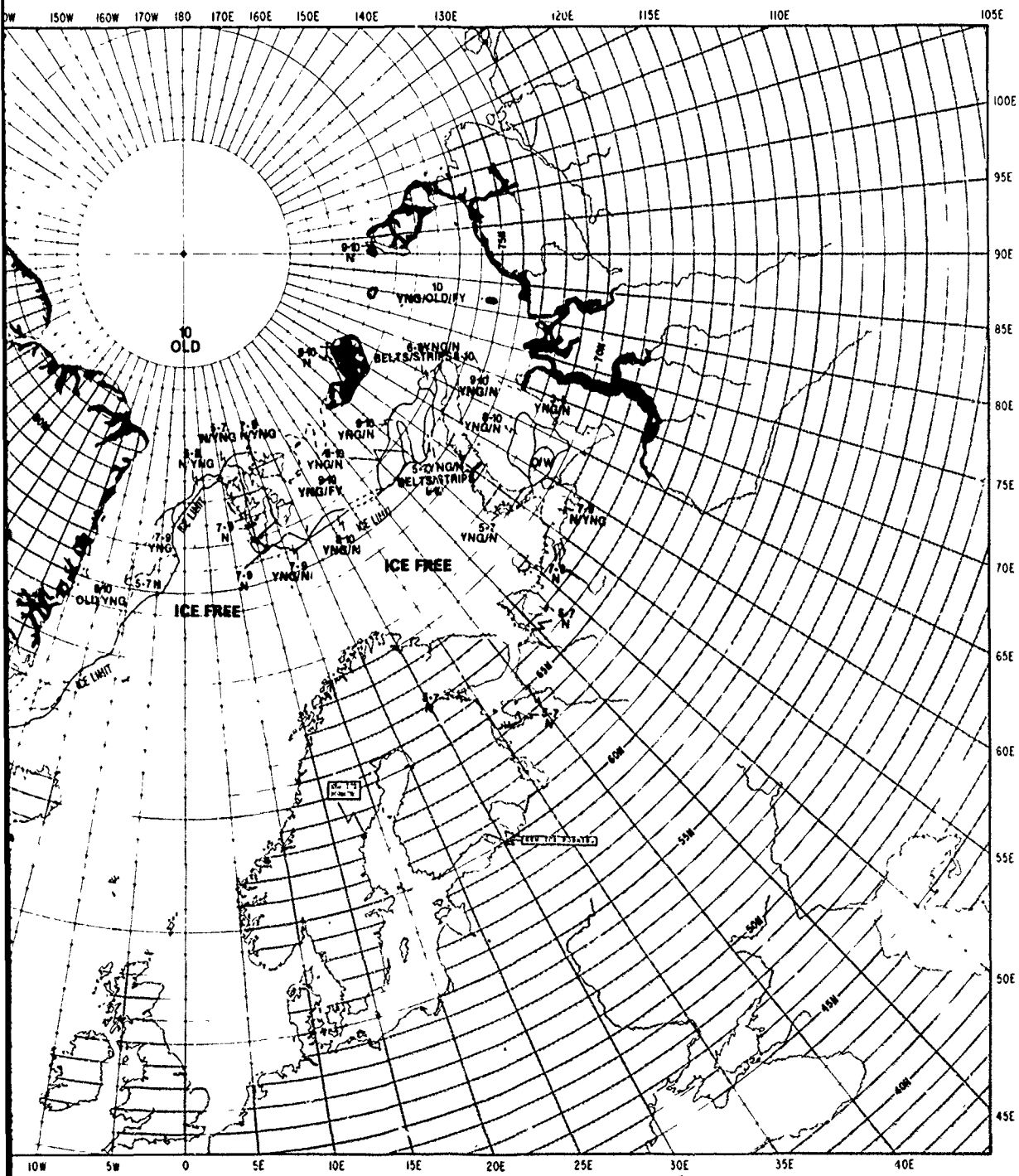






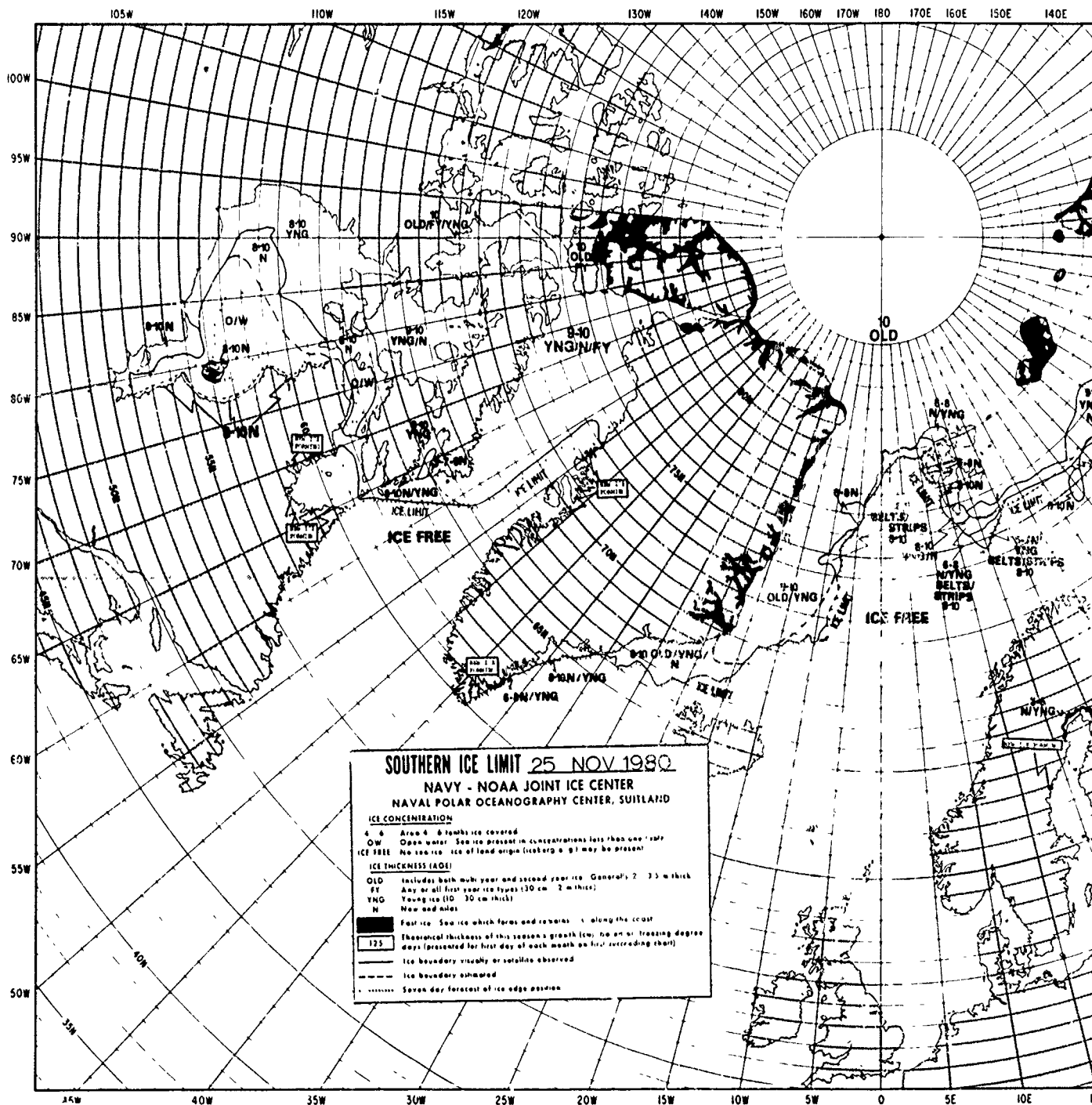


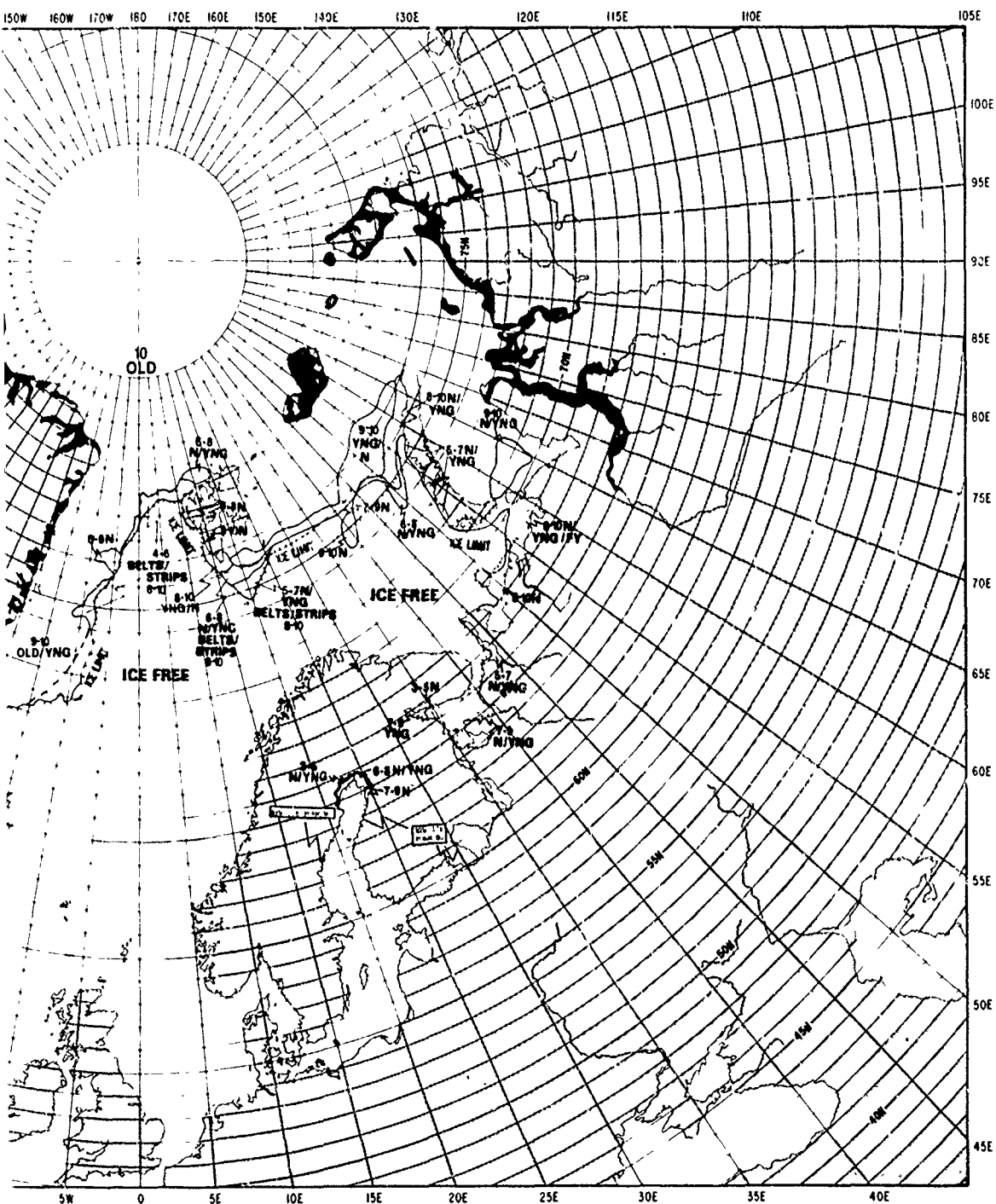




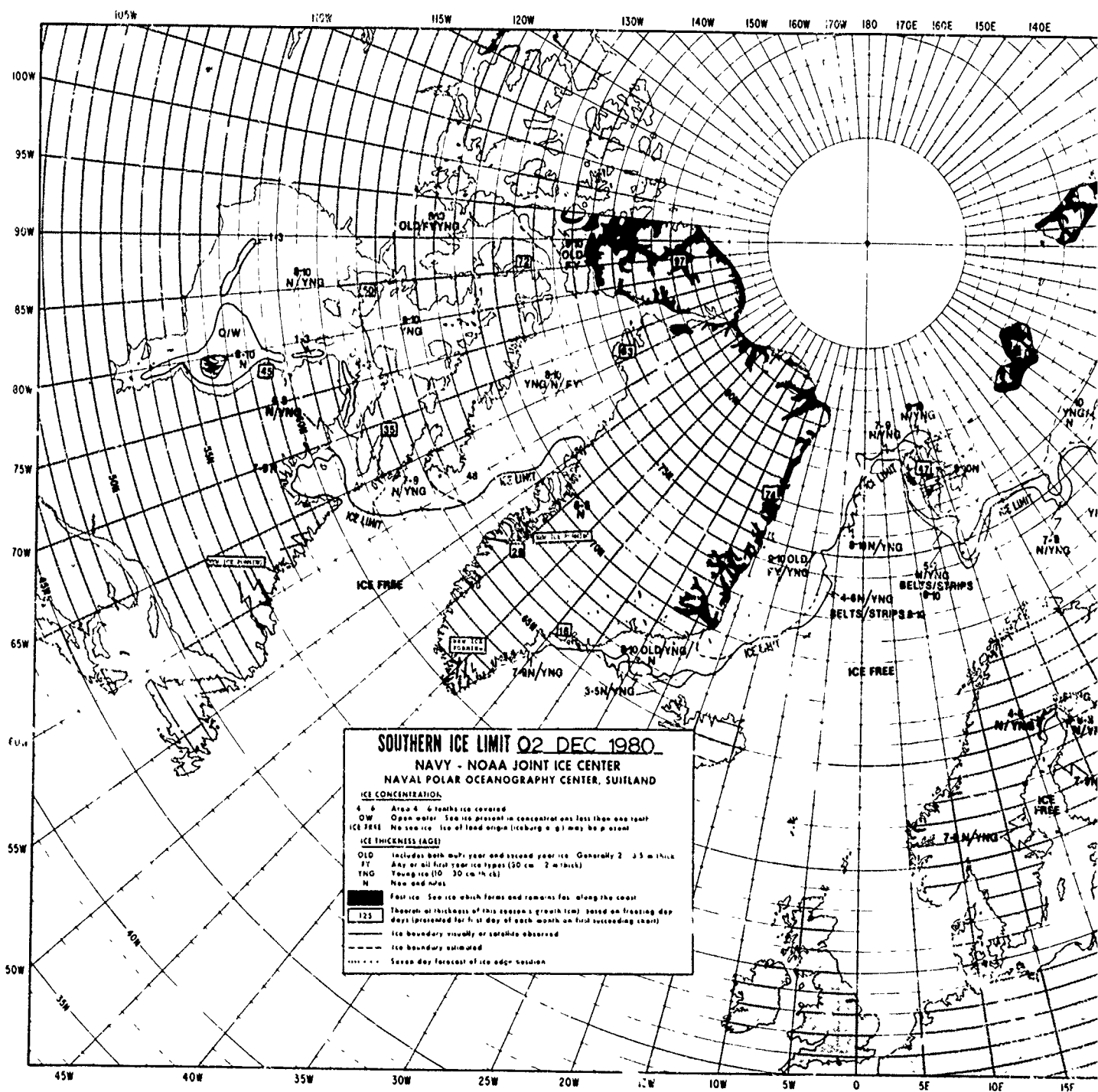
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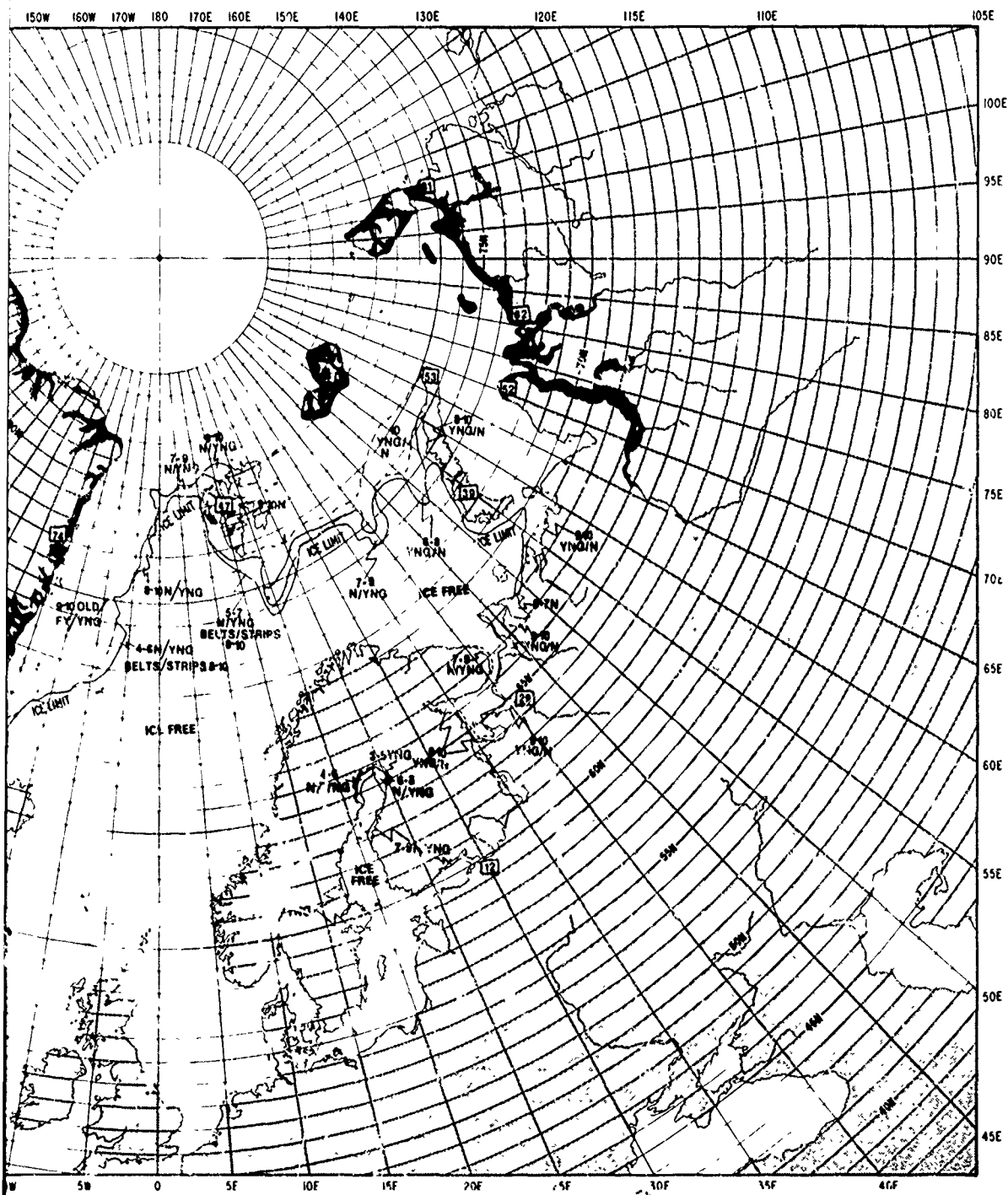


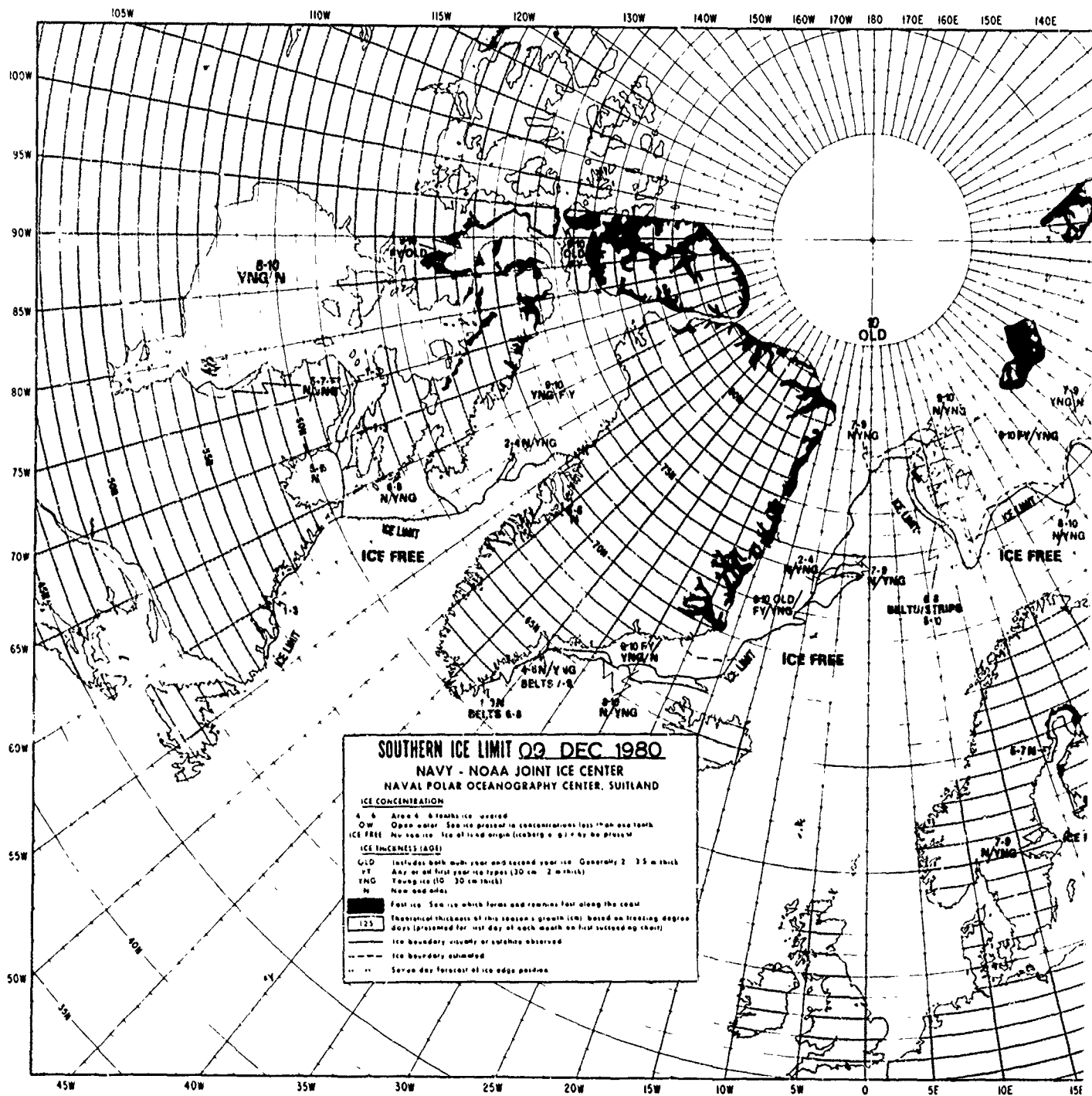


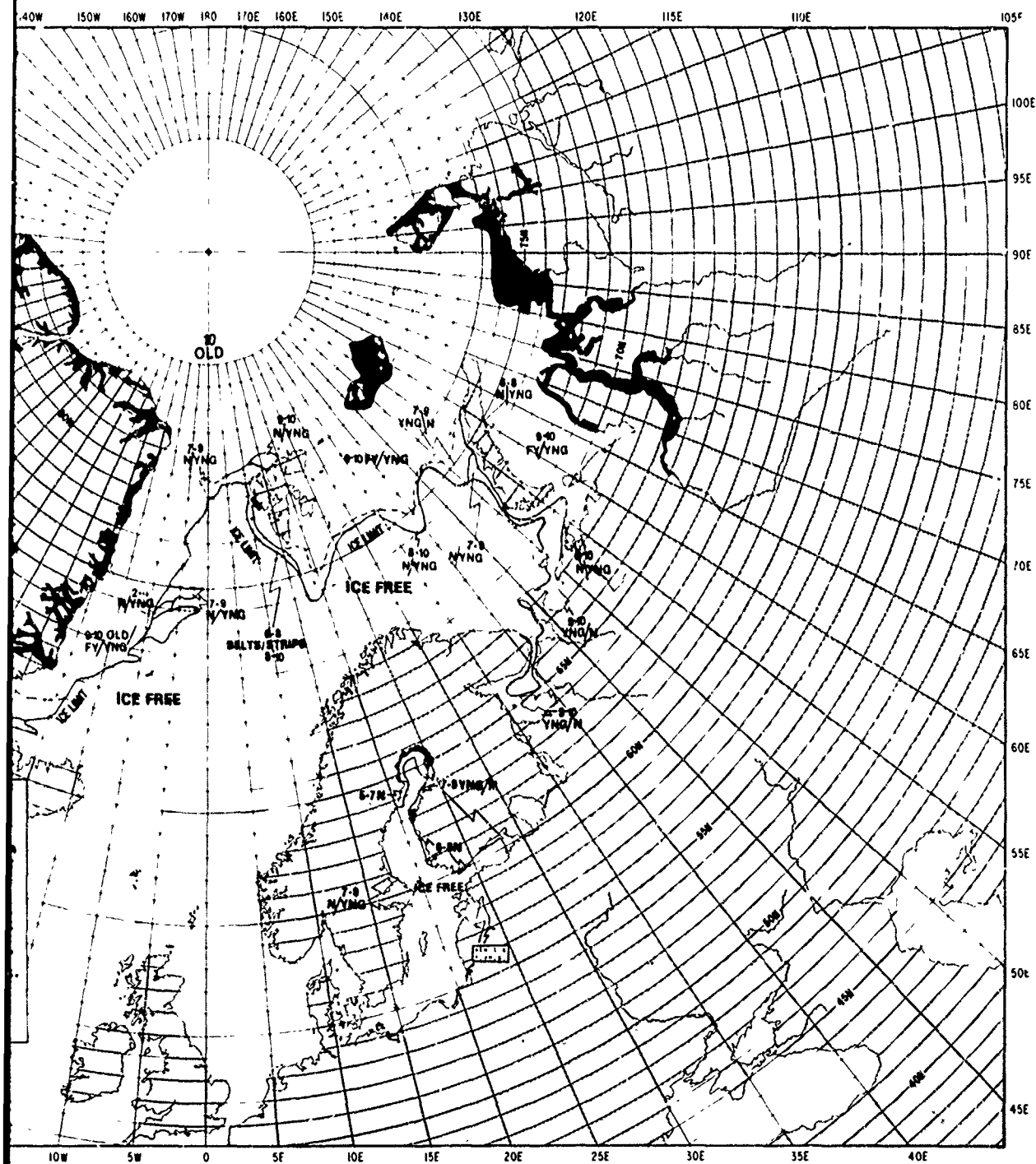


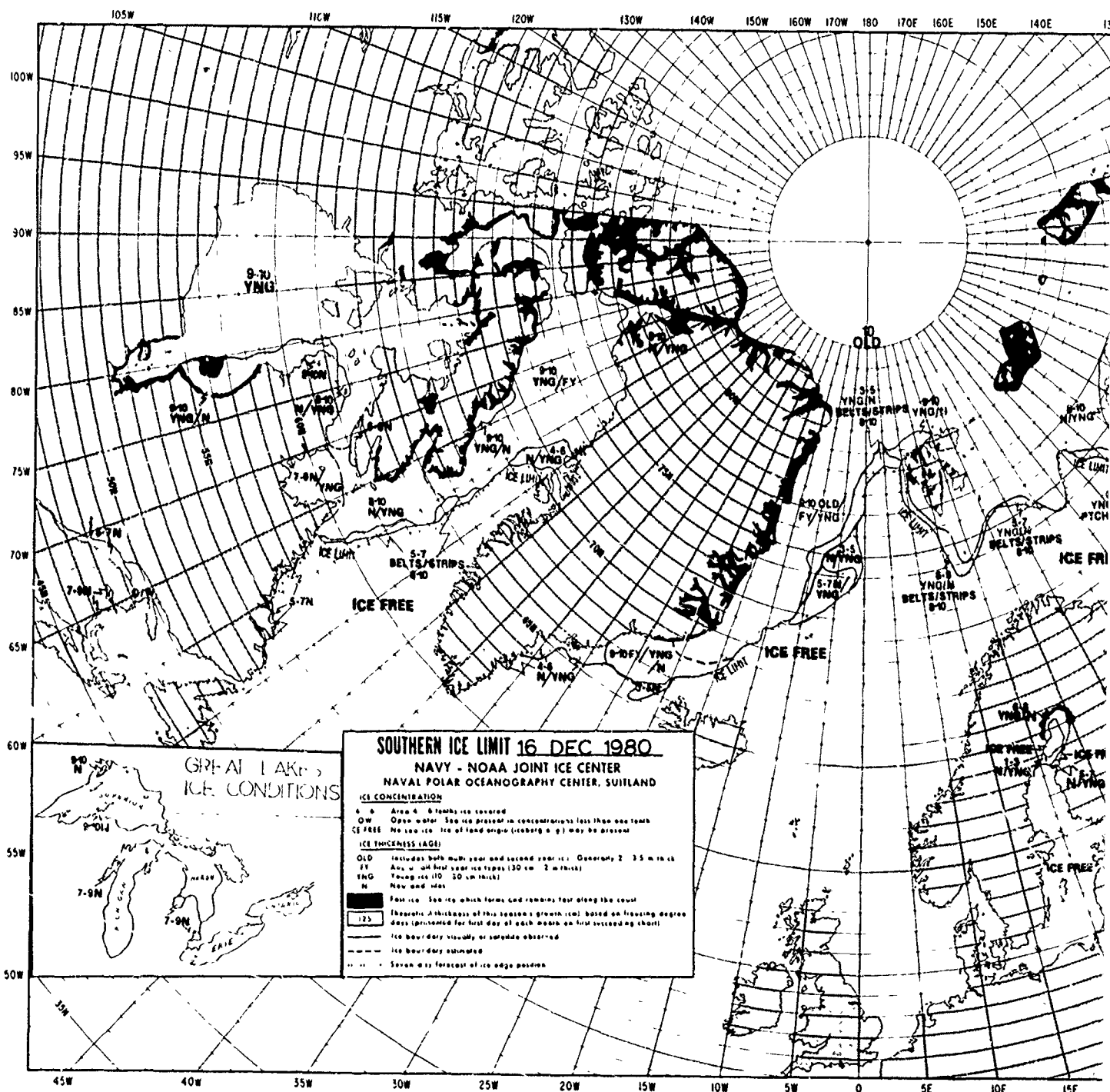
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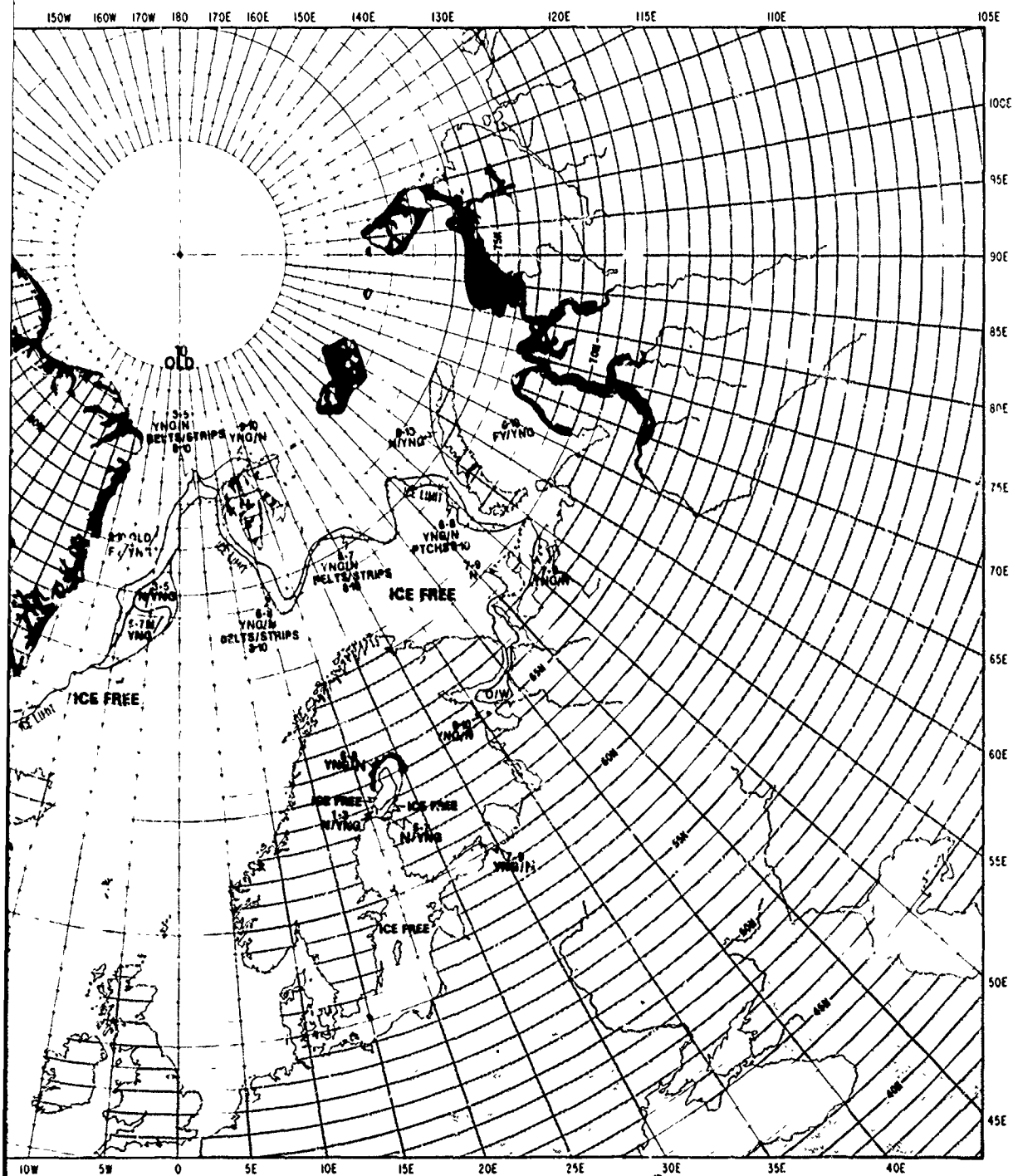






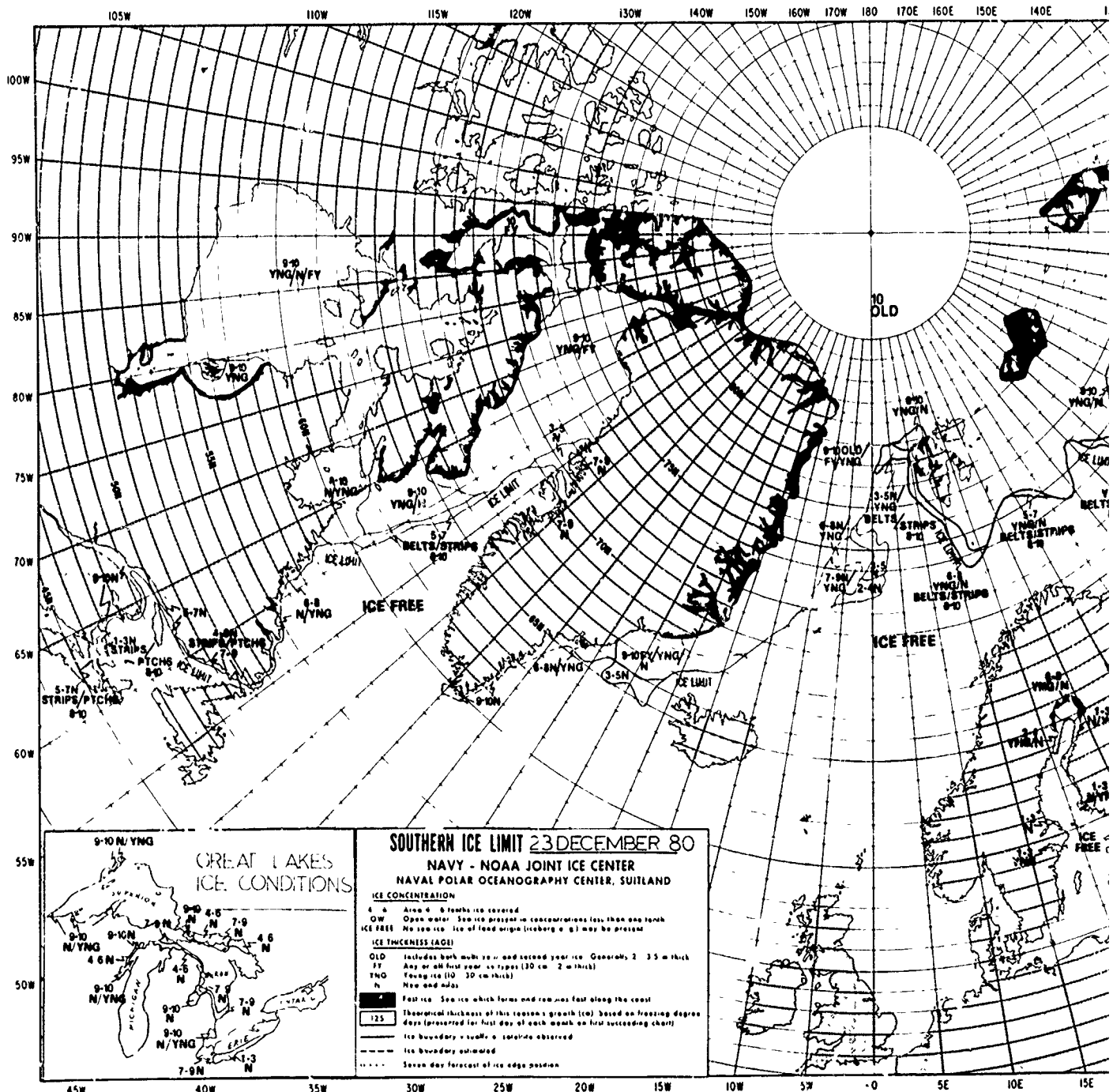


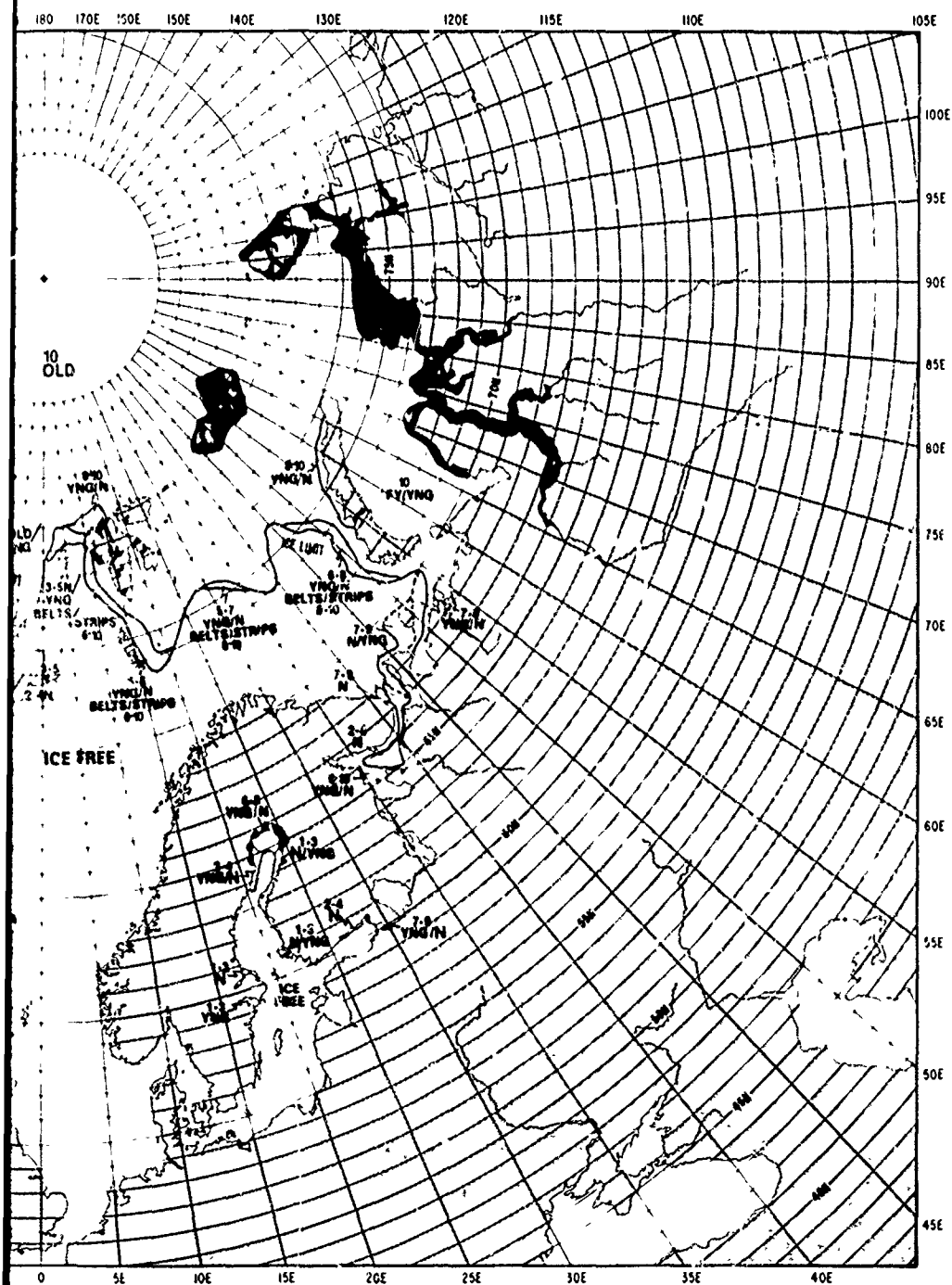




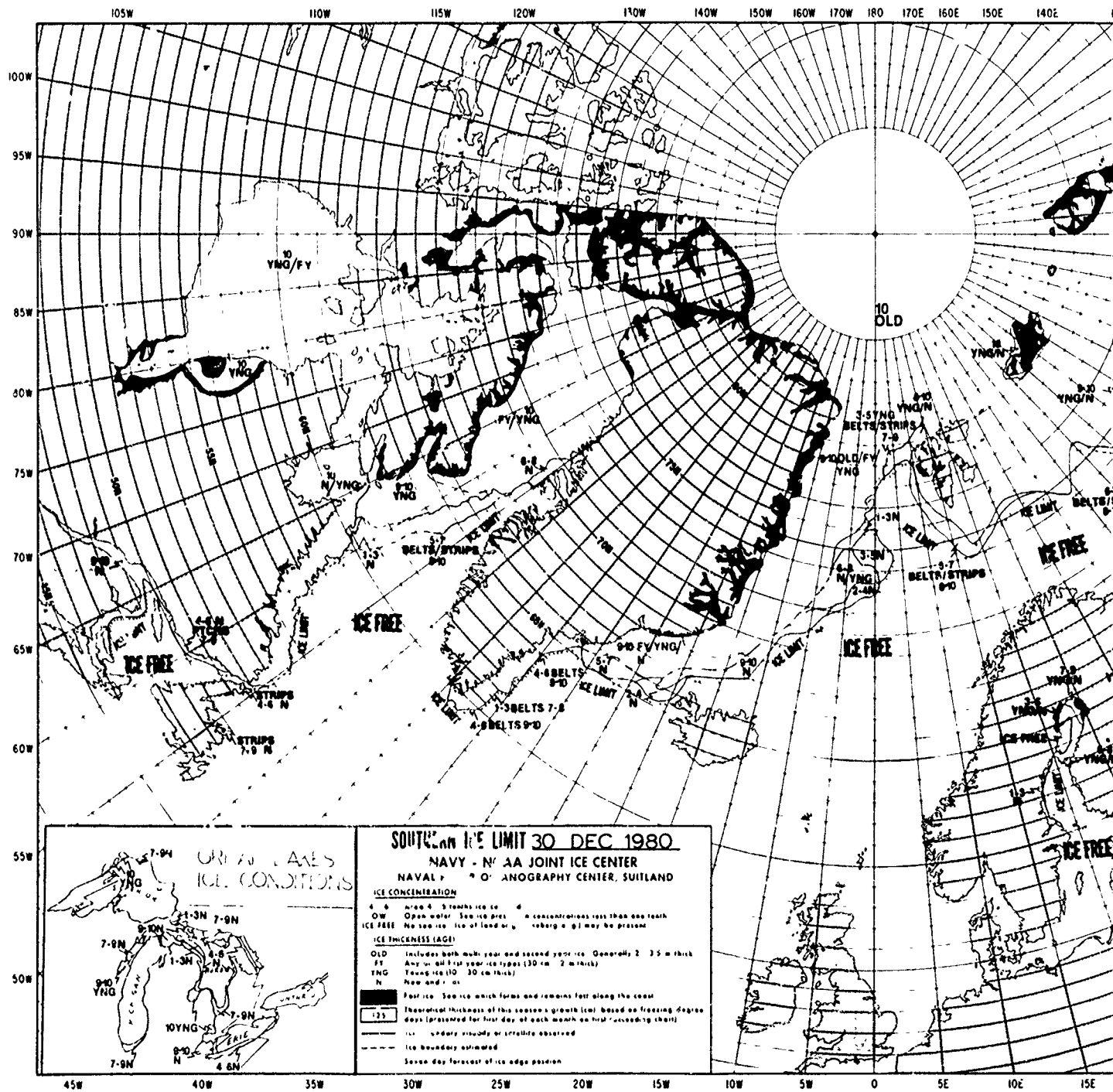
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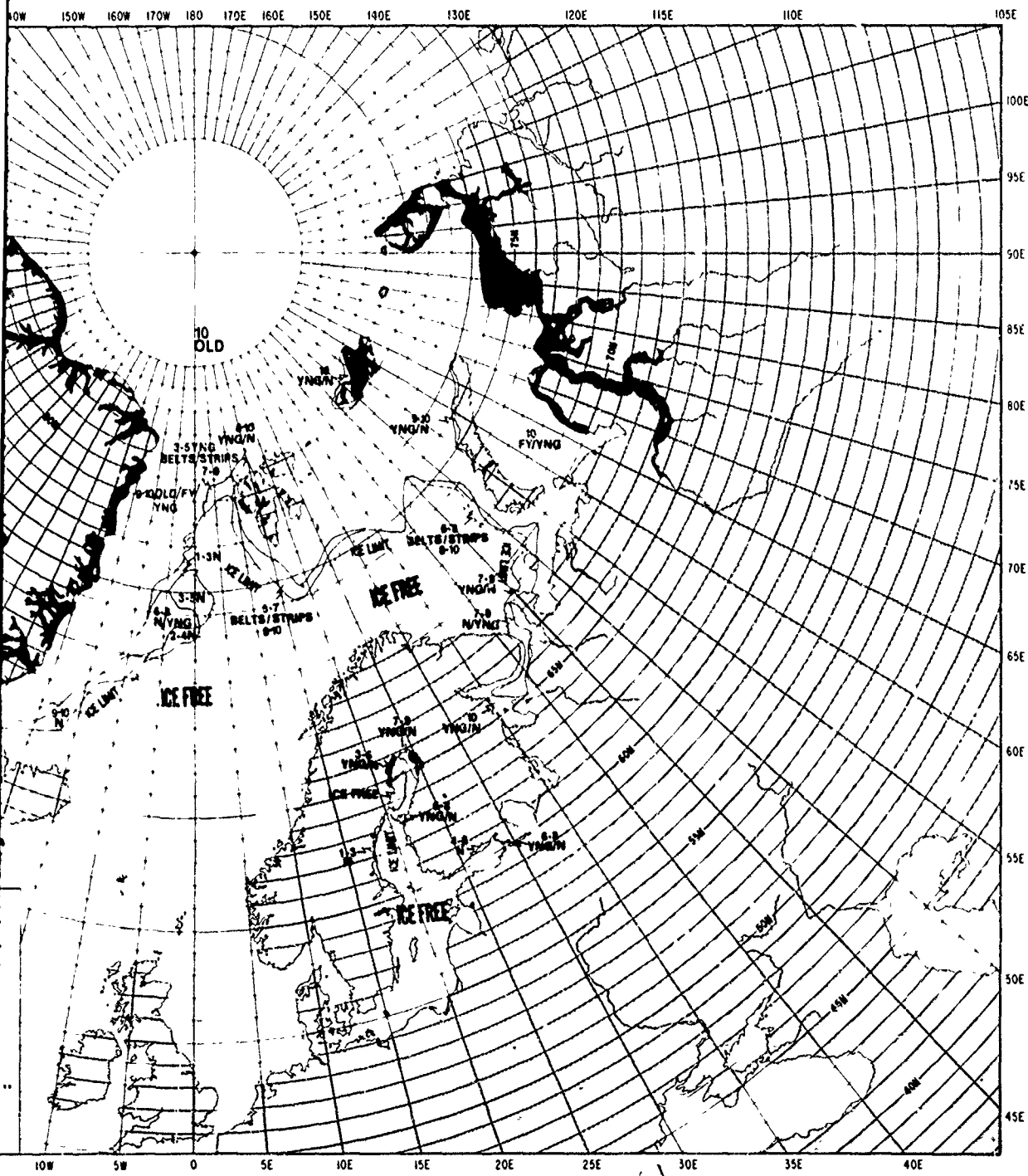


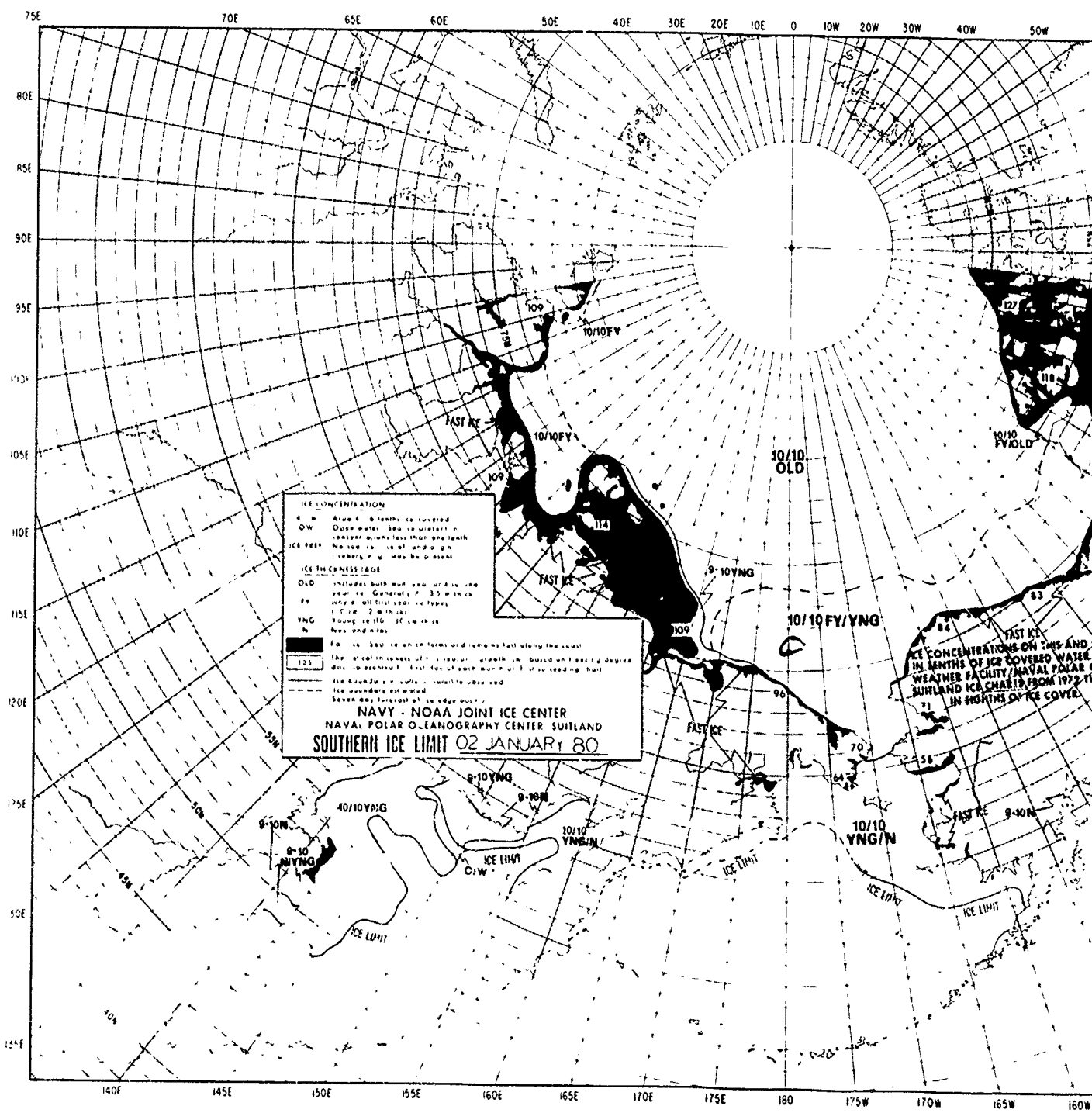




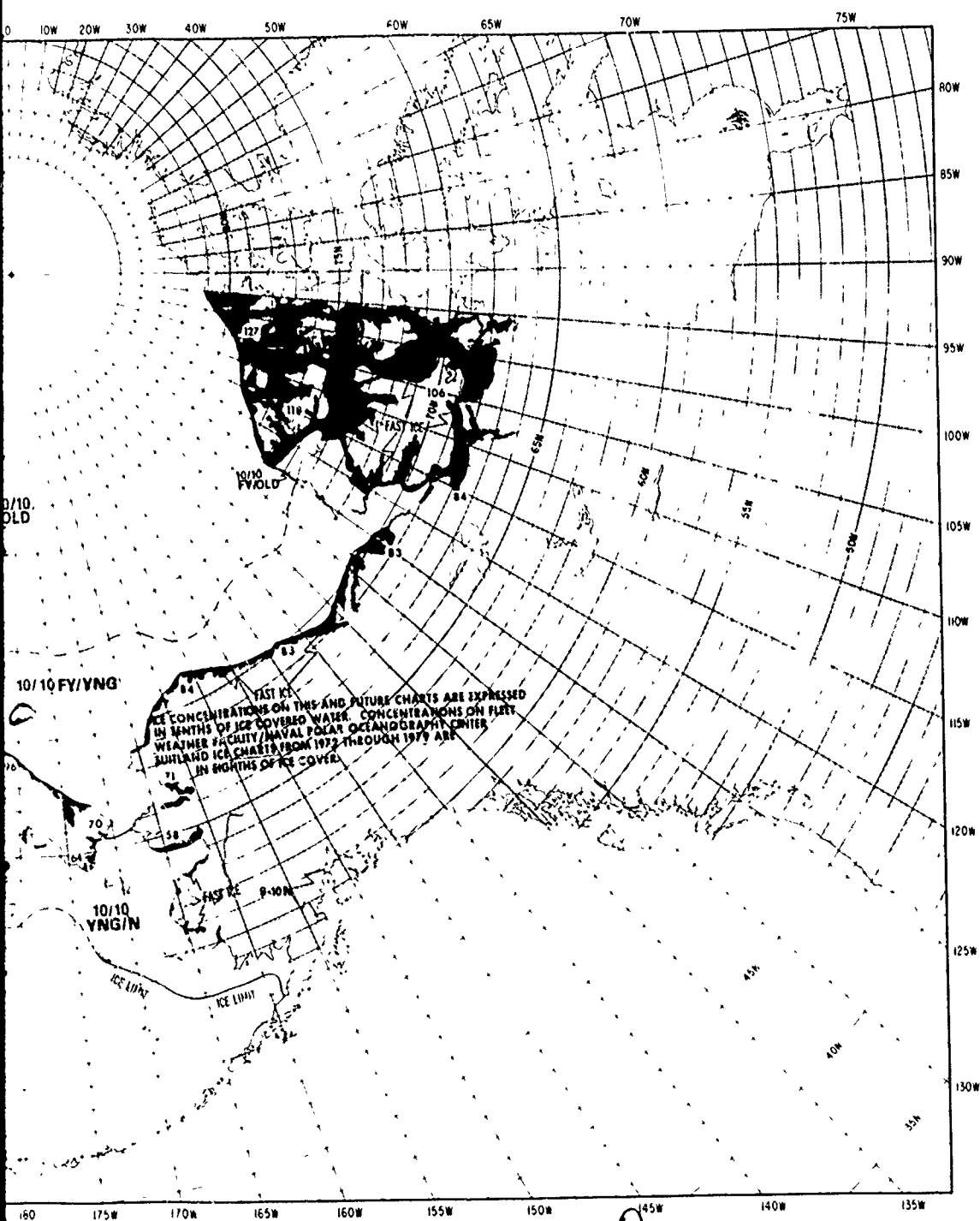
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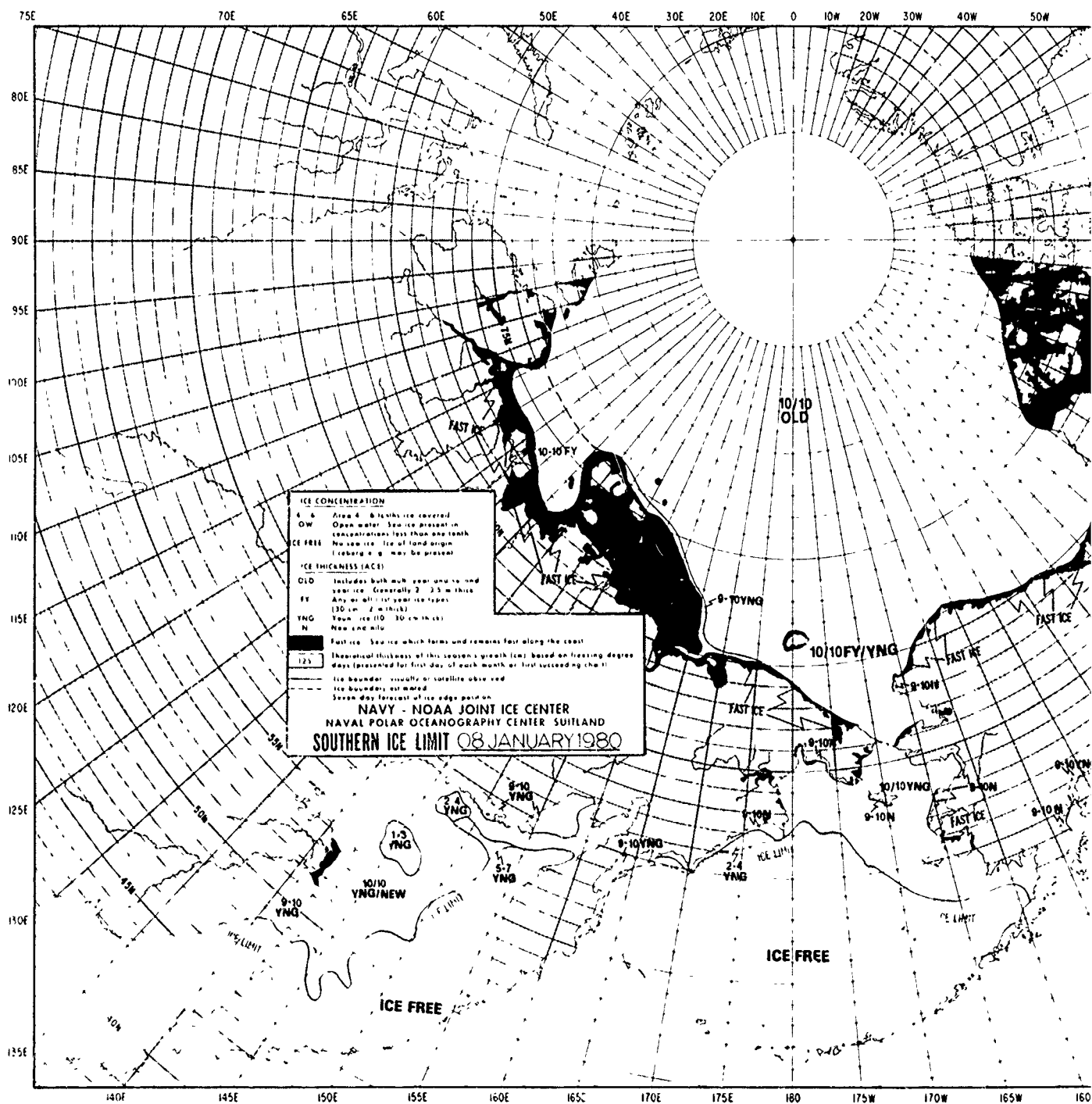


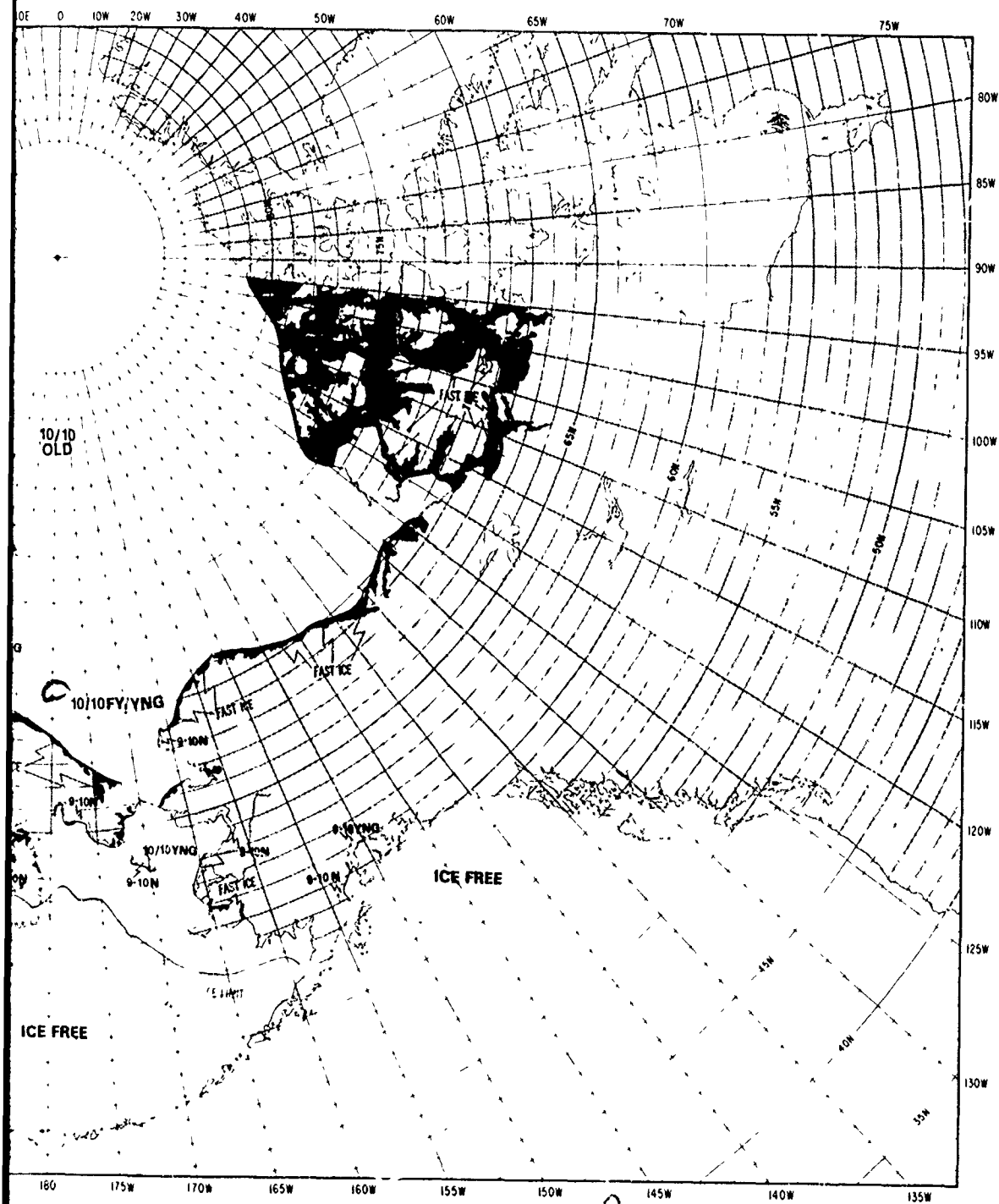


ICE CONCENTRATIONS ON THIS AND IN MONTHS OF ICE COVERED WATER WEATHER FACILITY/NAVAL POLAR SUITLAND ICE CHARTS FROM 1972-73 IN MONTHS OF ICE COVER.

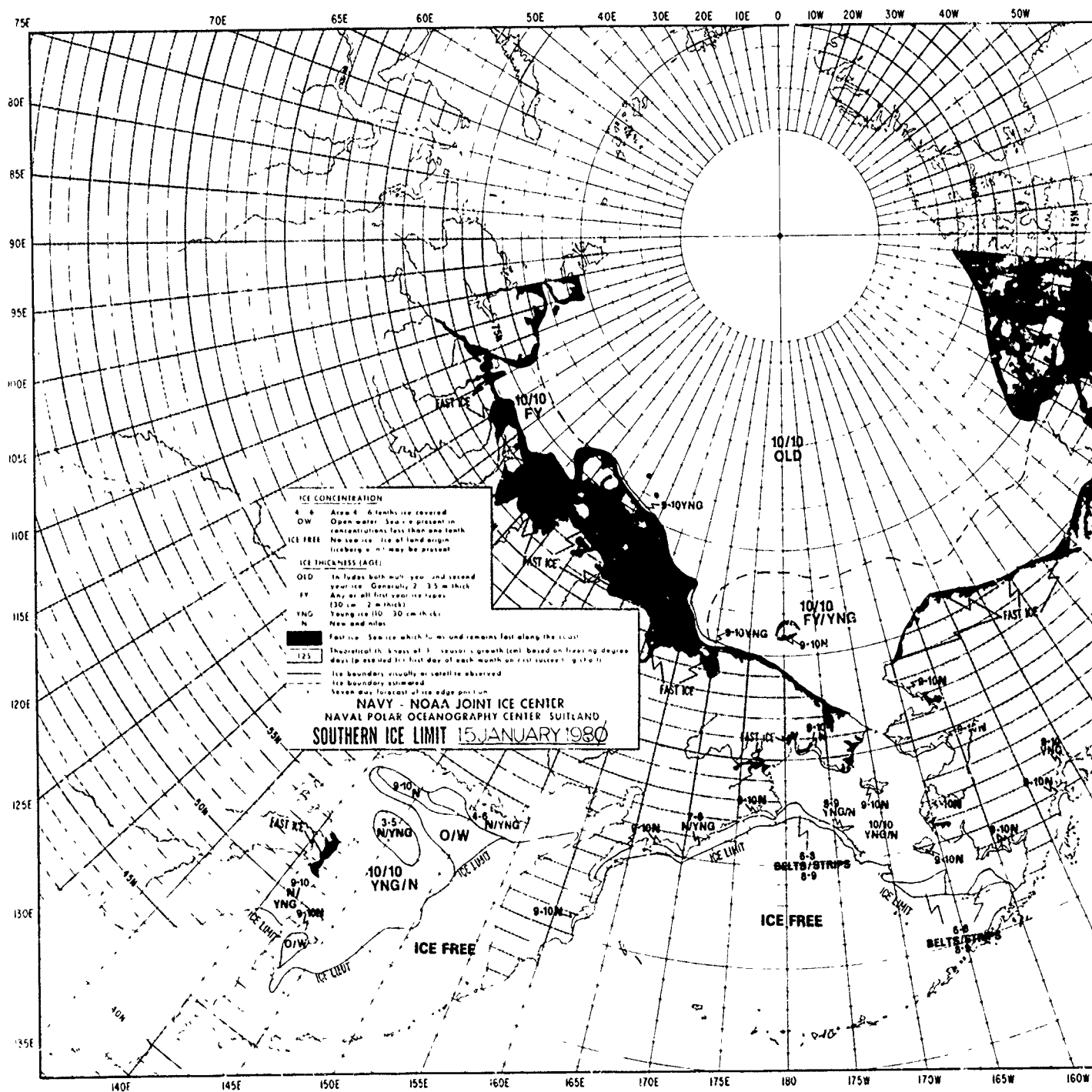


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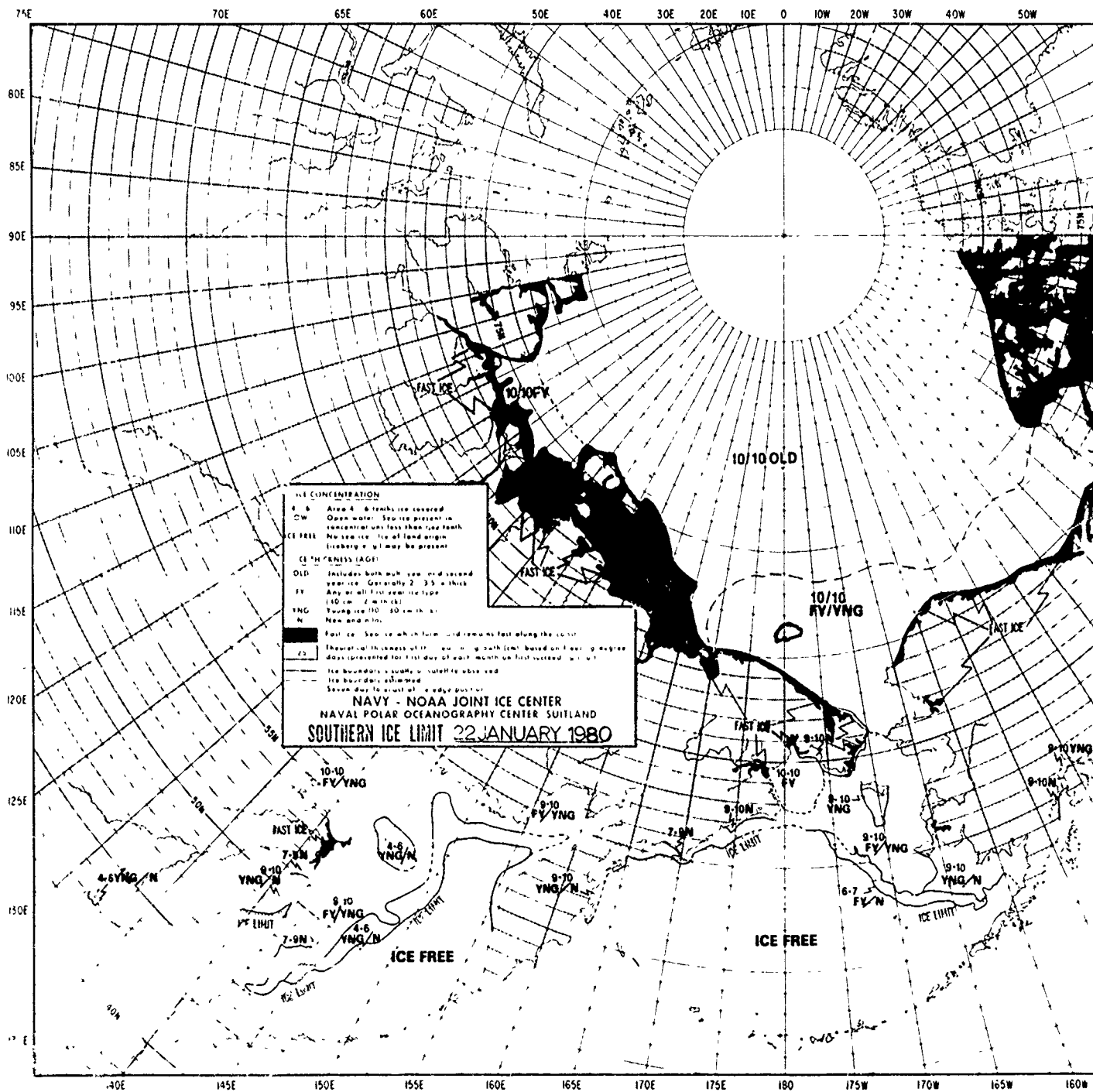




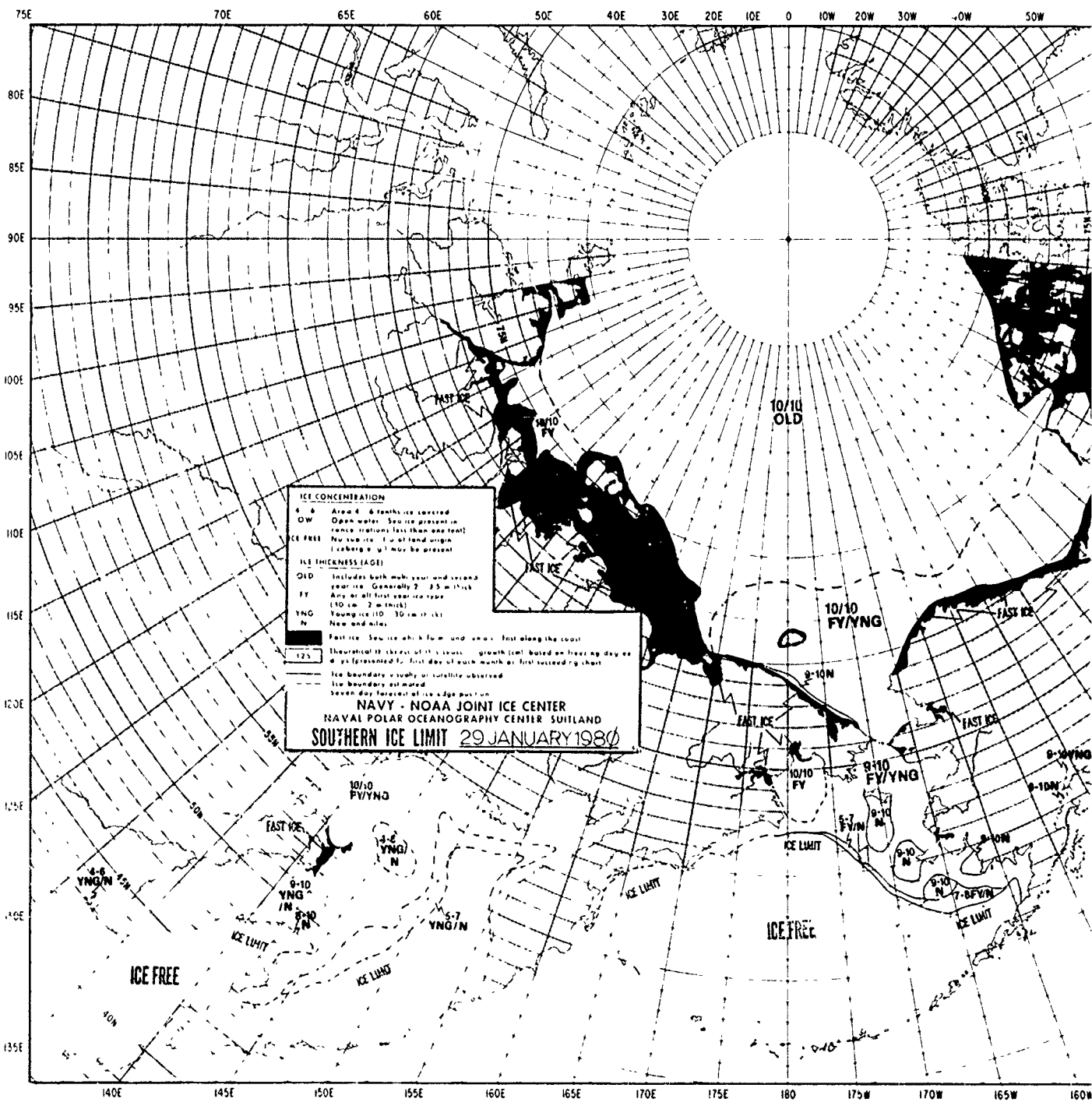




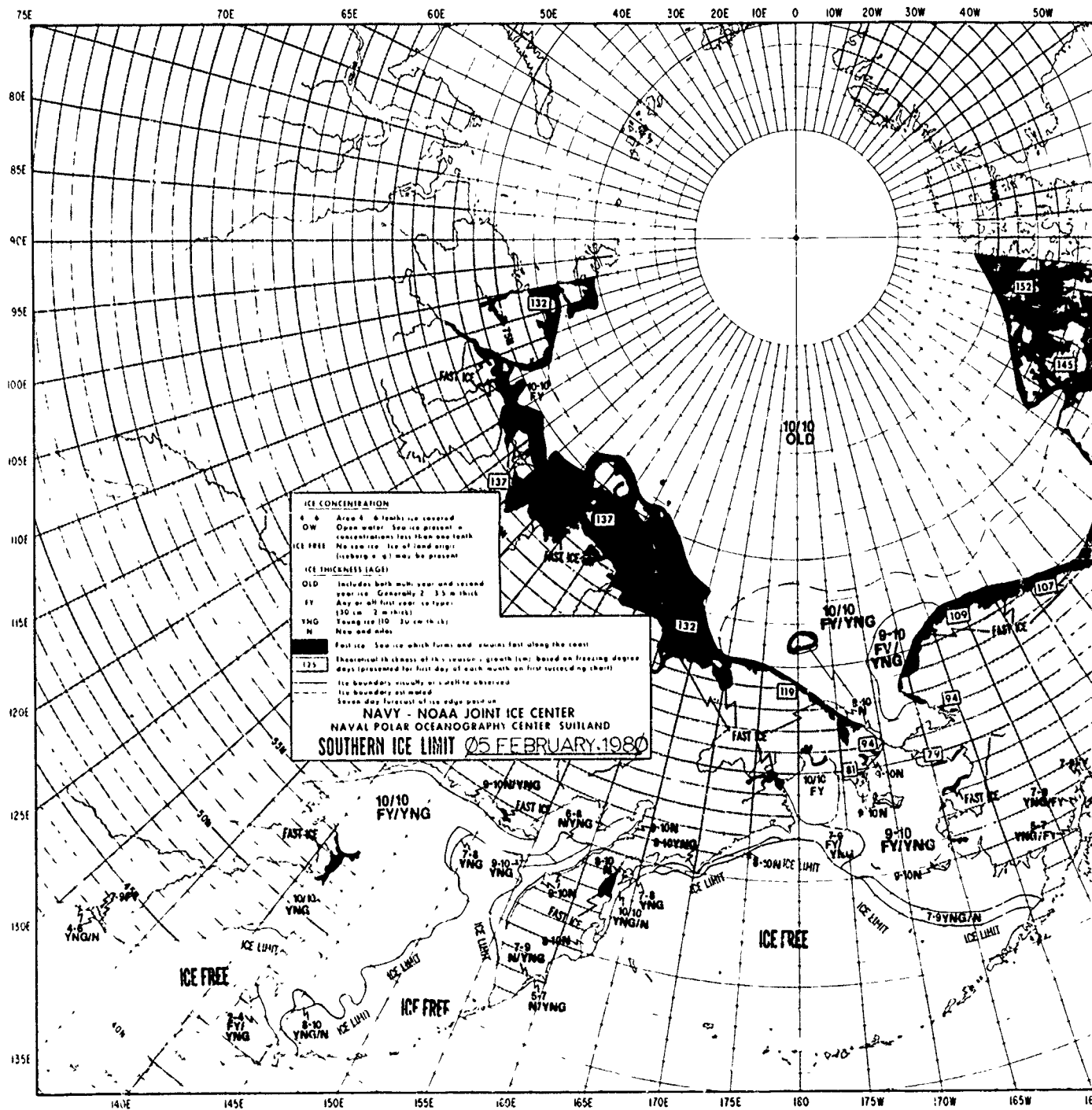


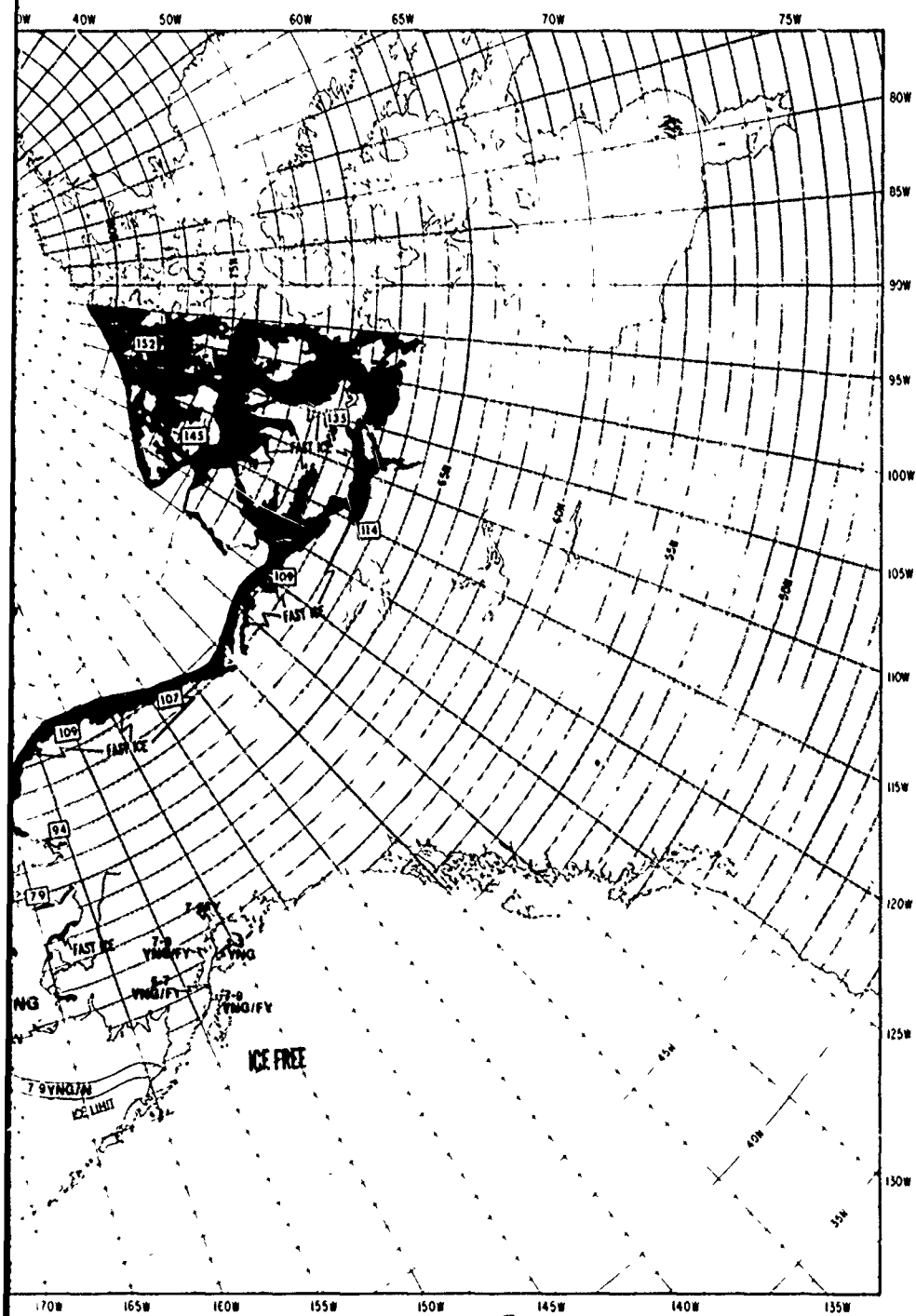






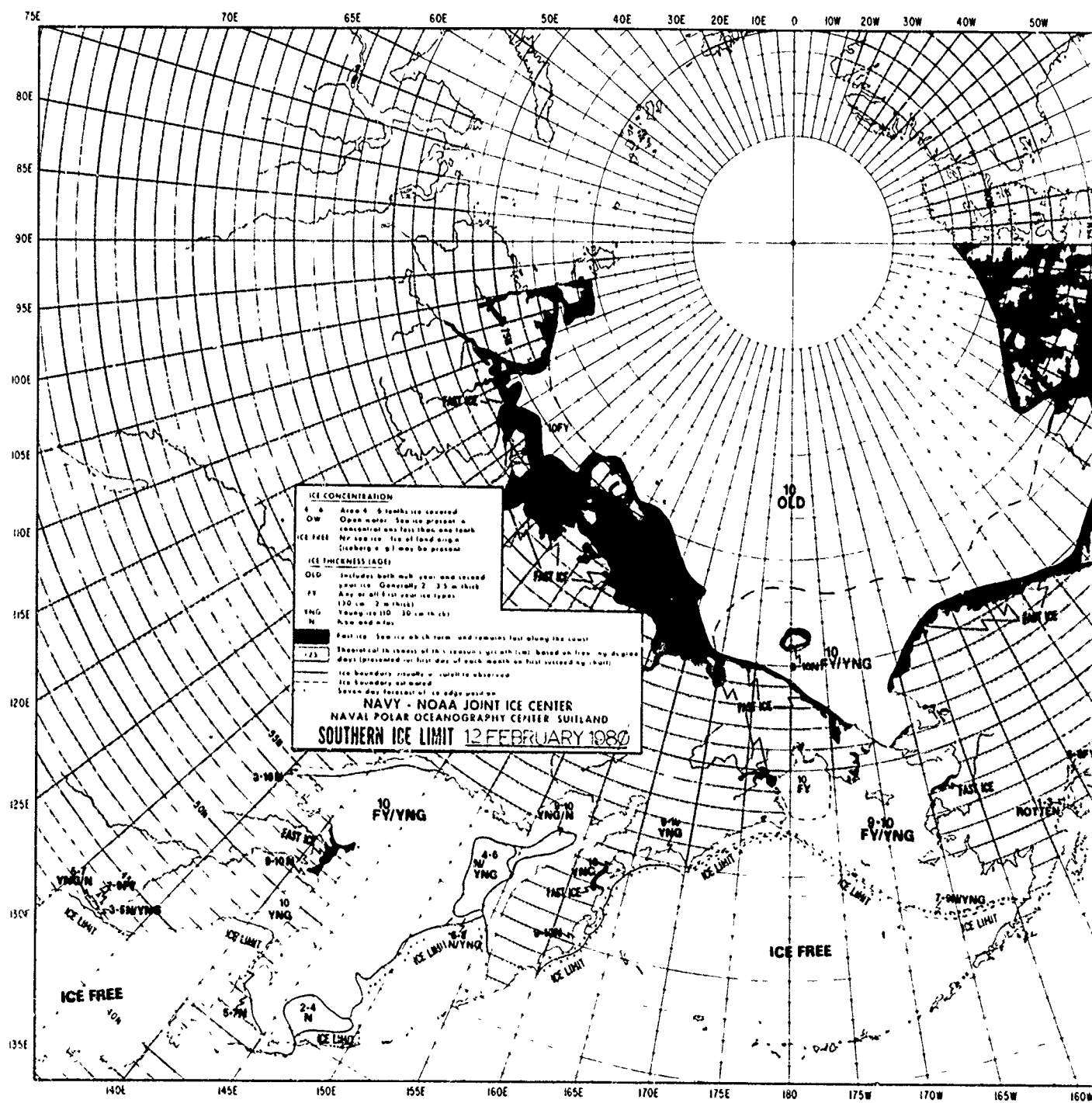


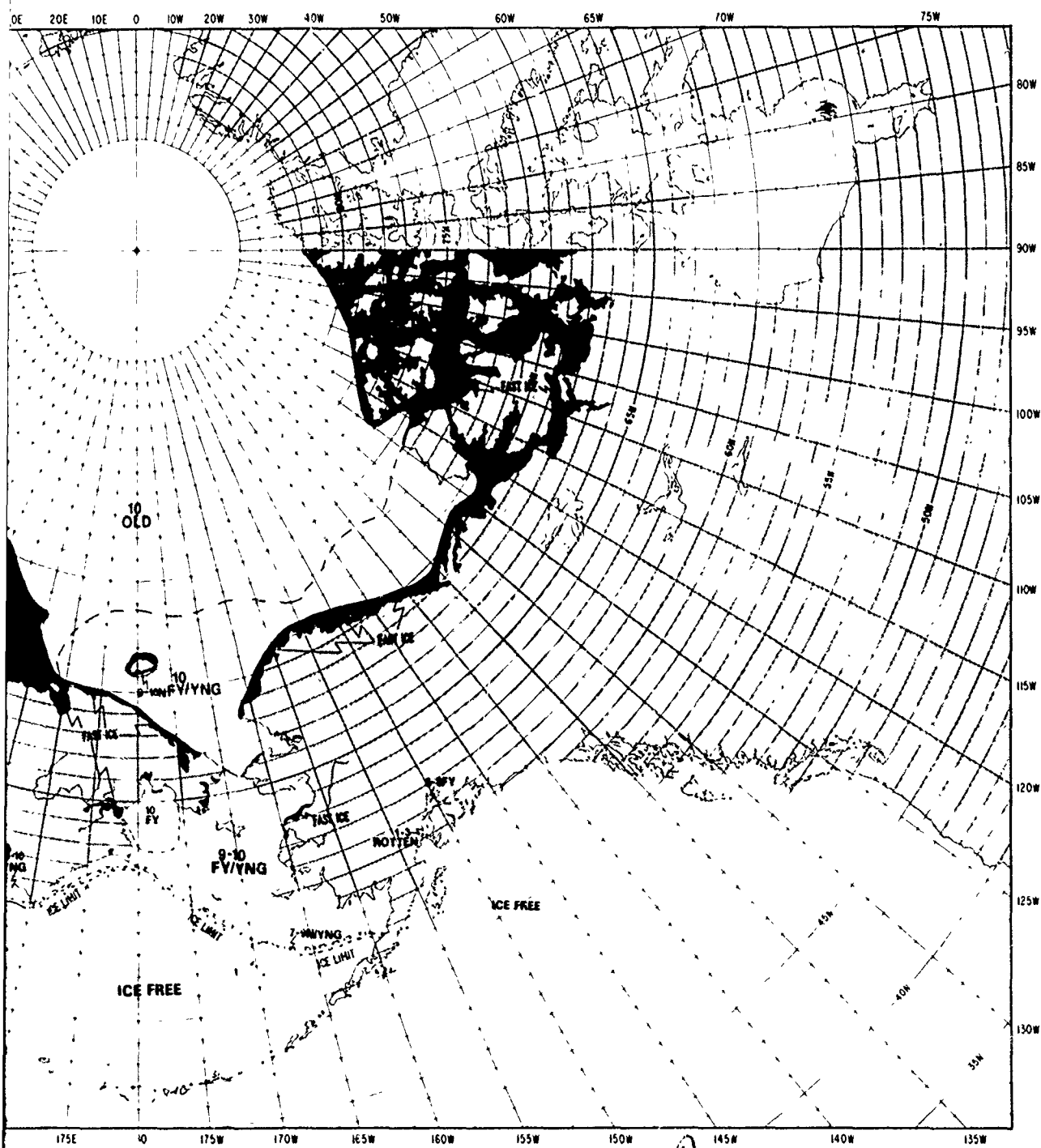




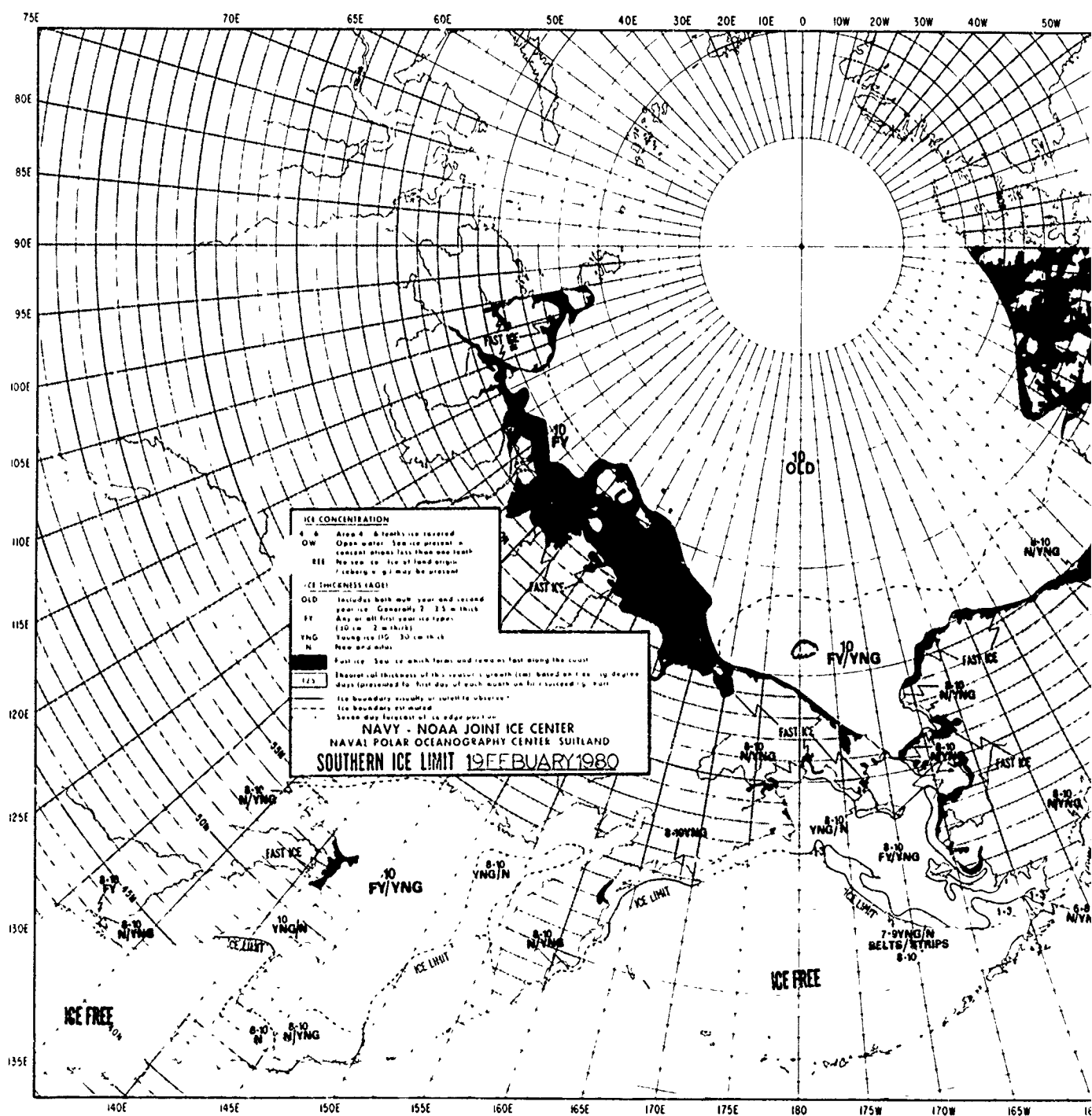
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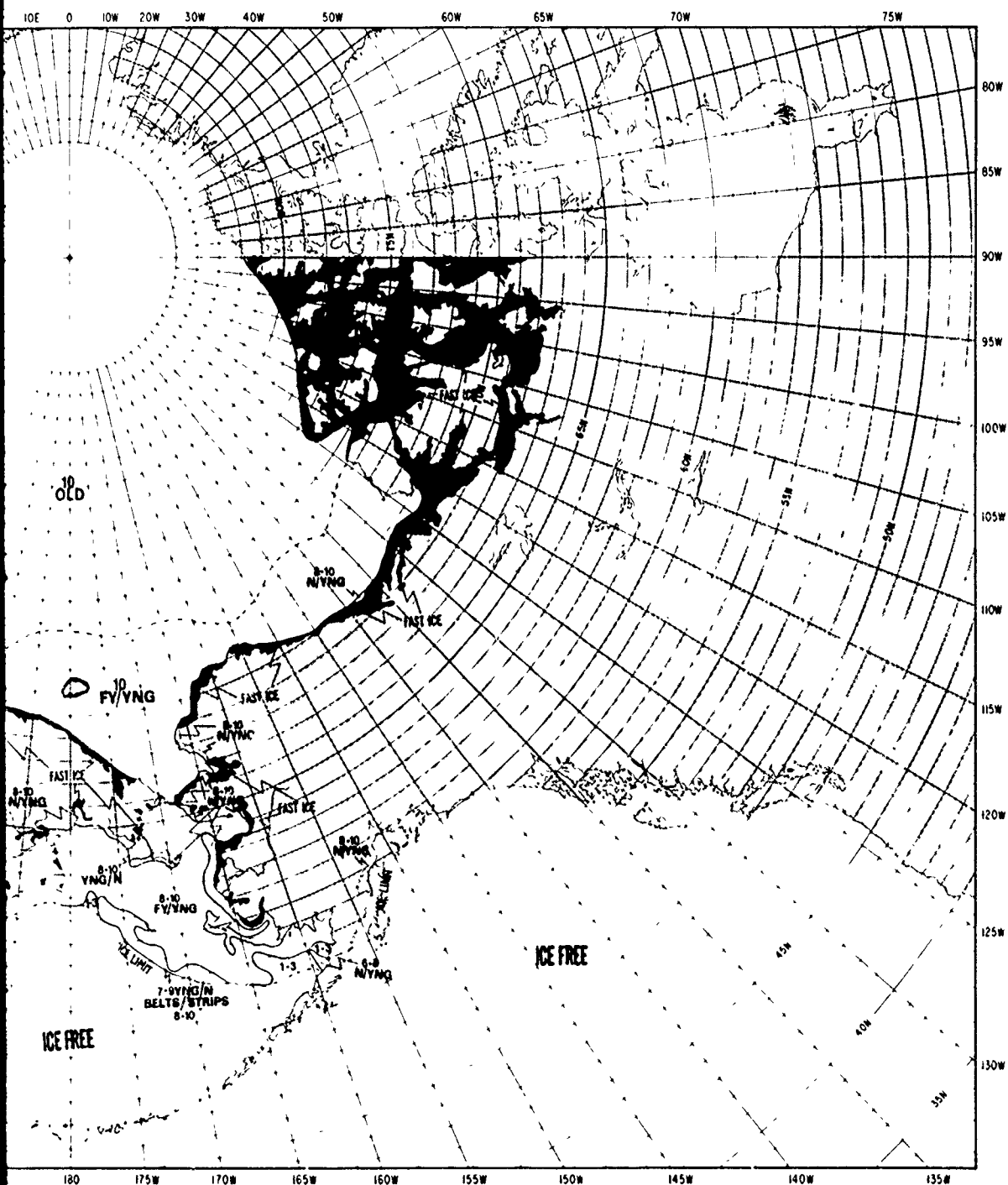




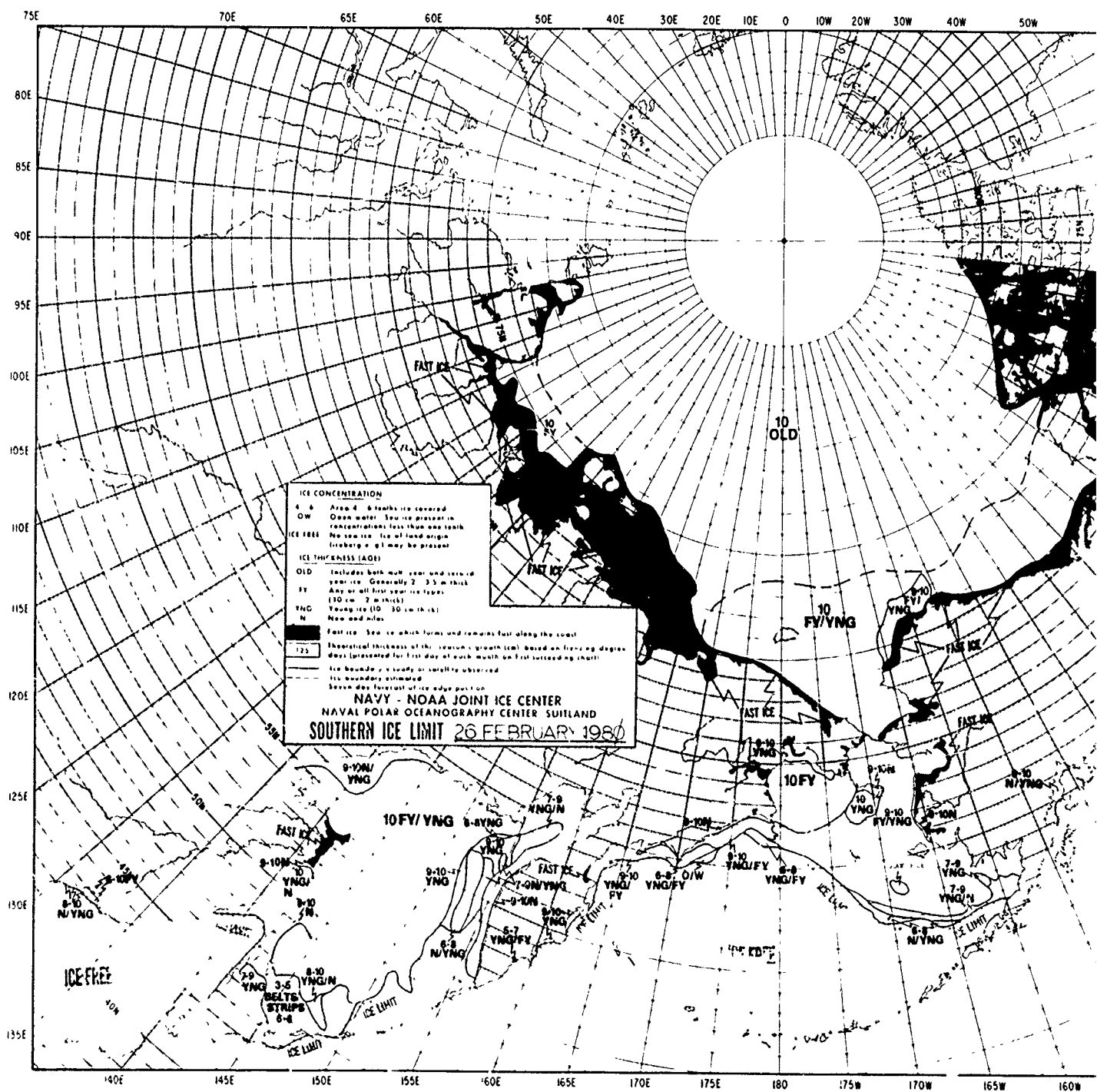


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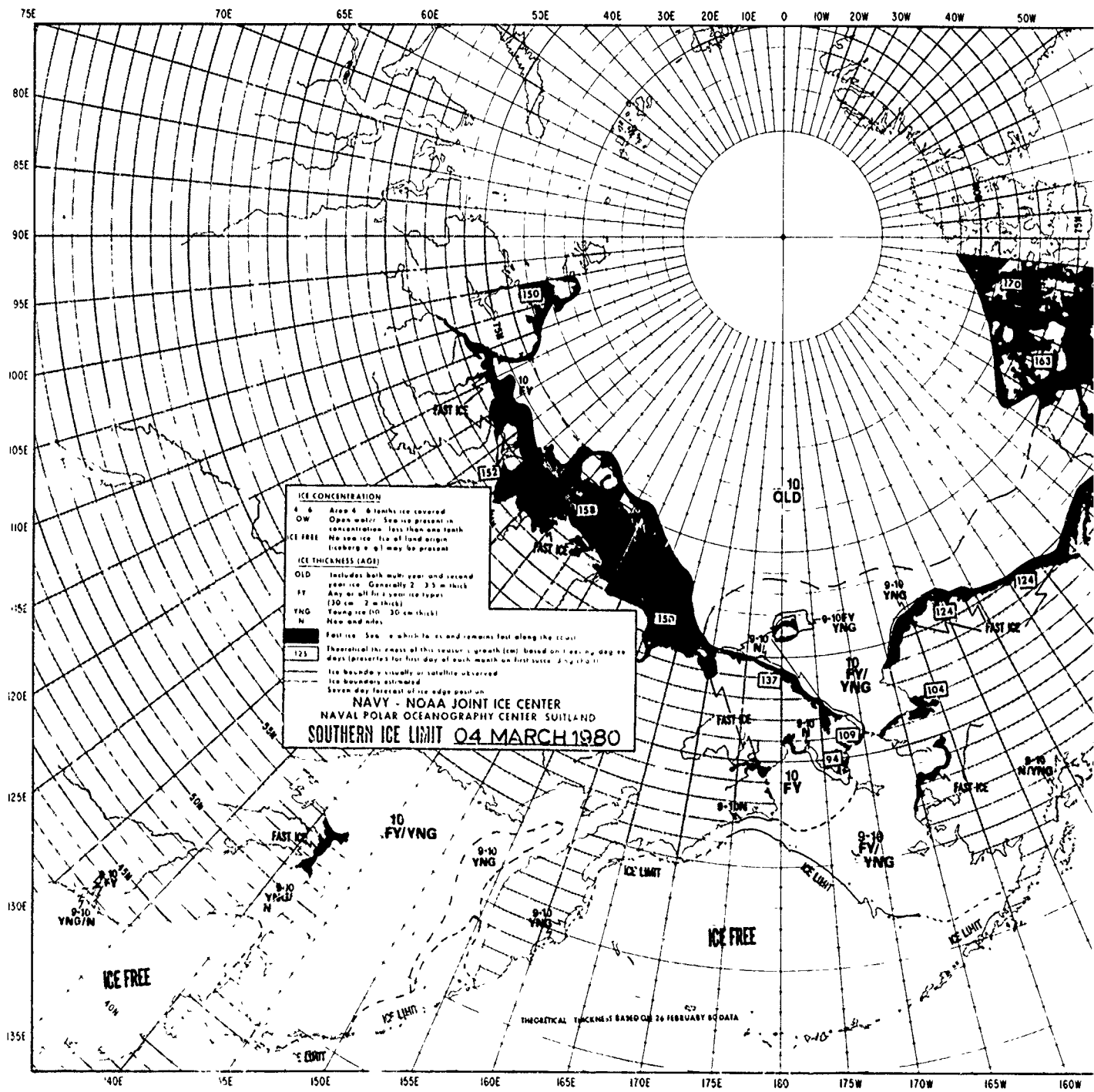


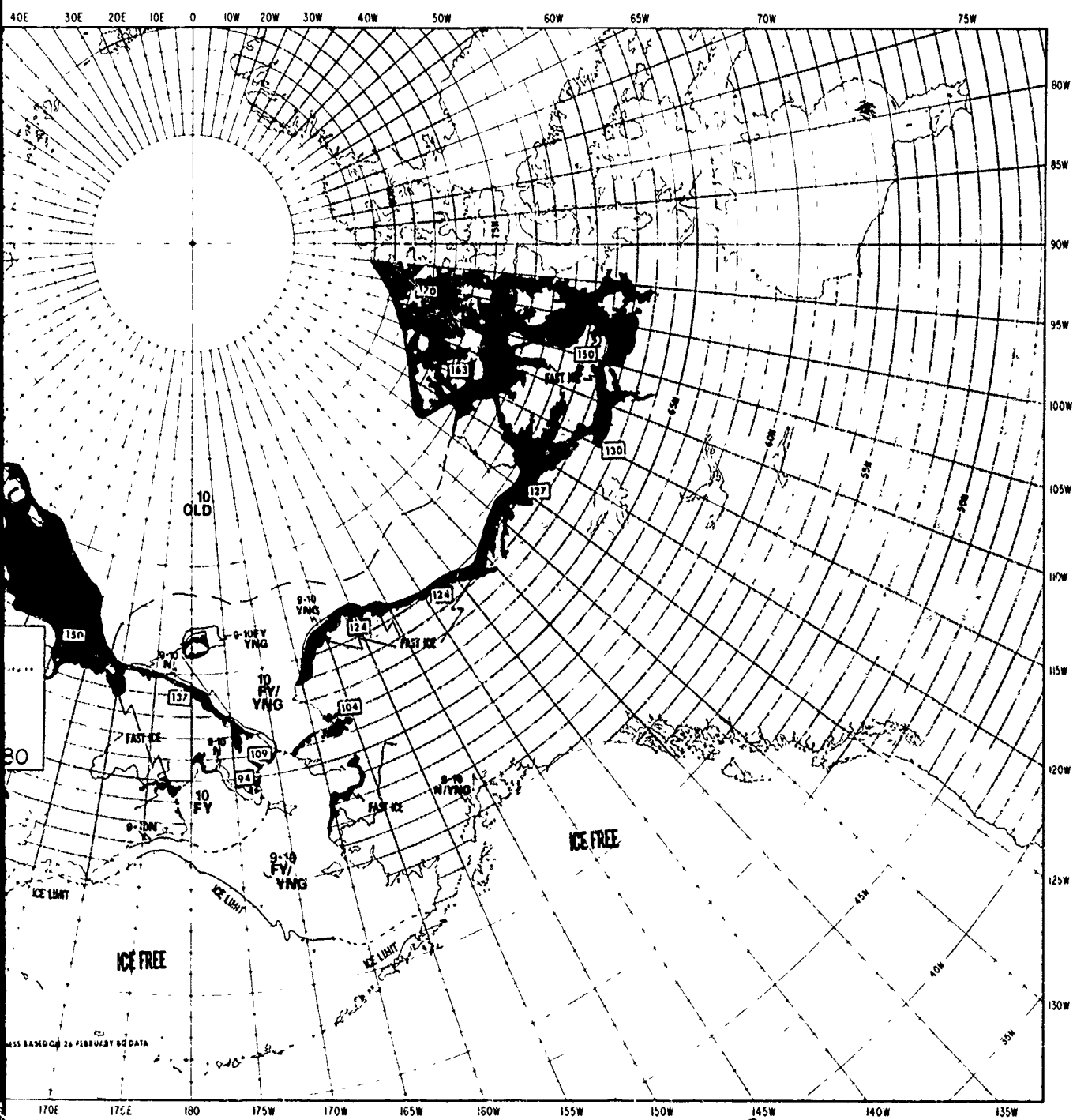


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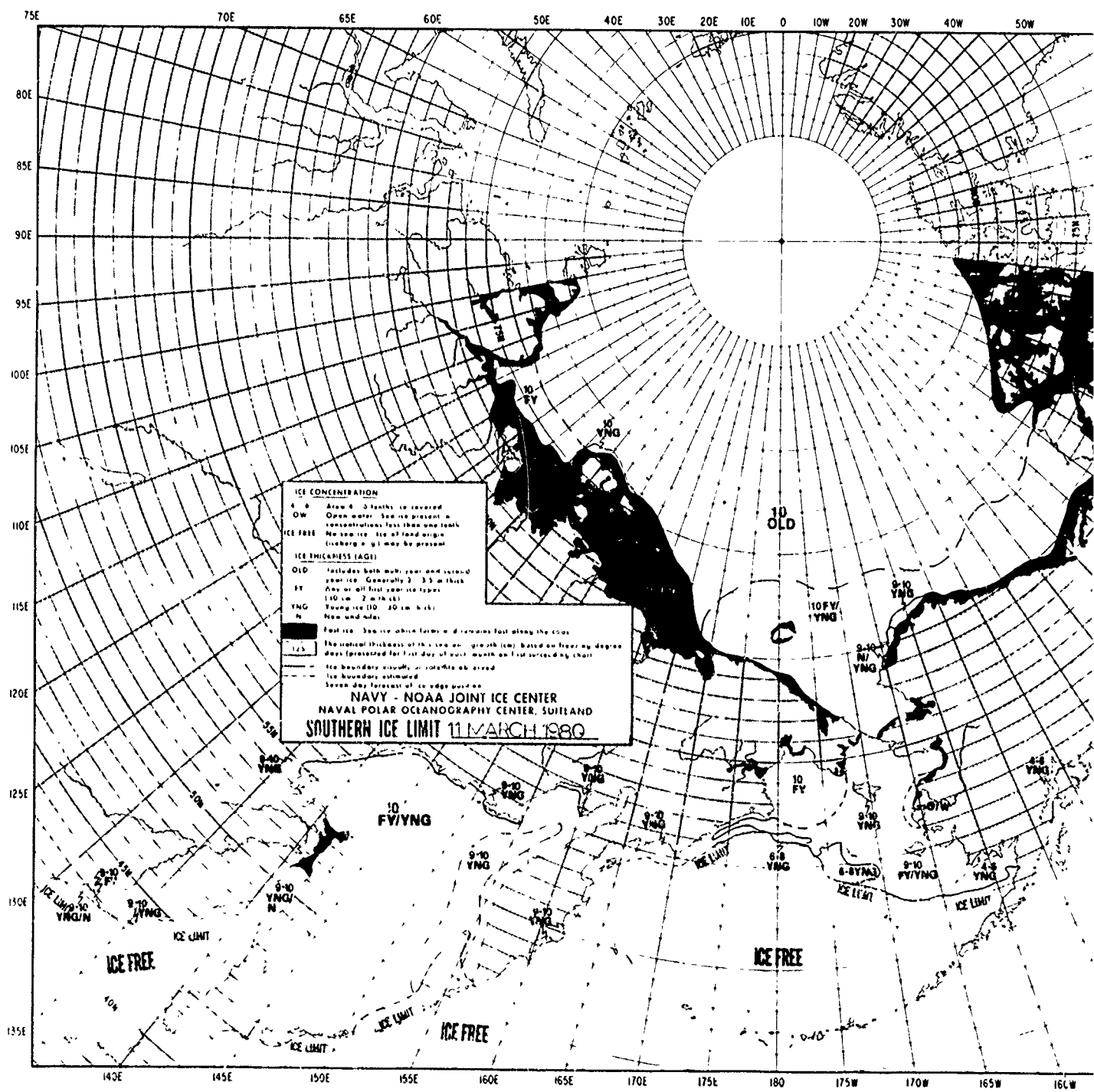


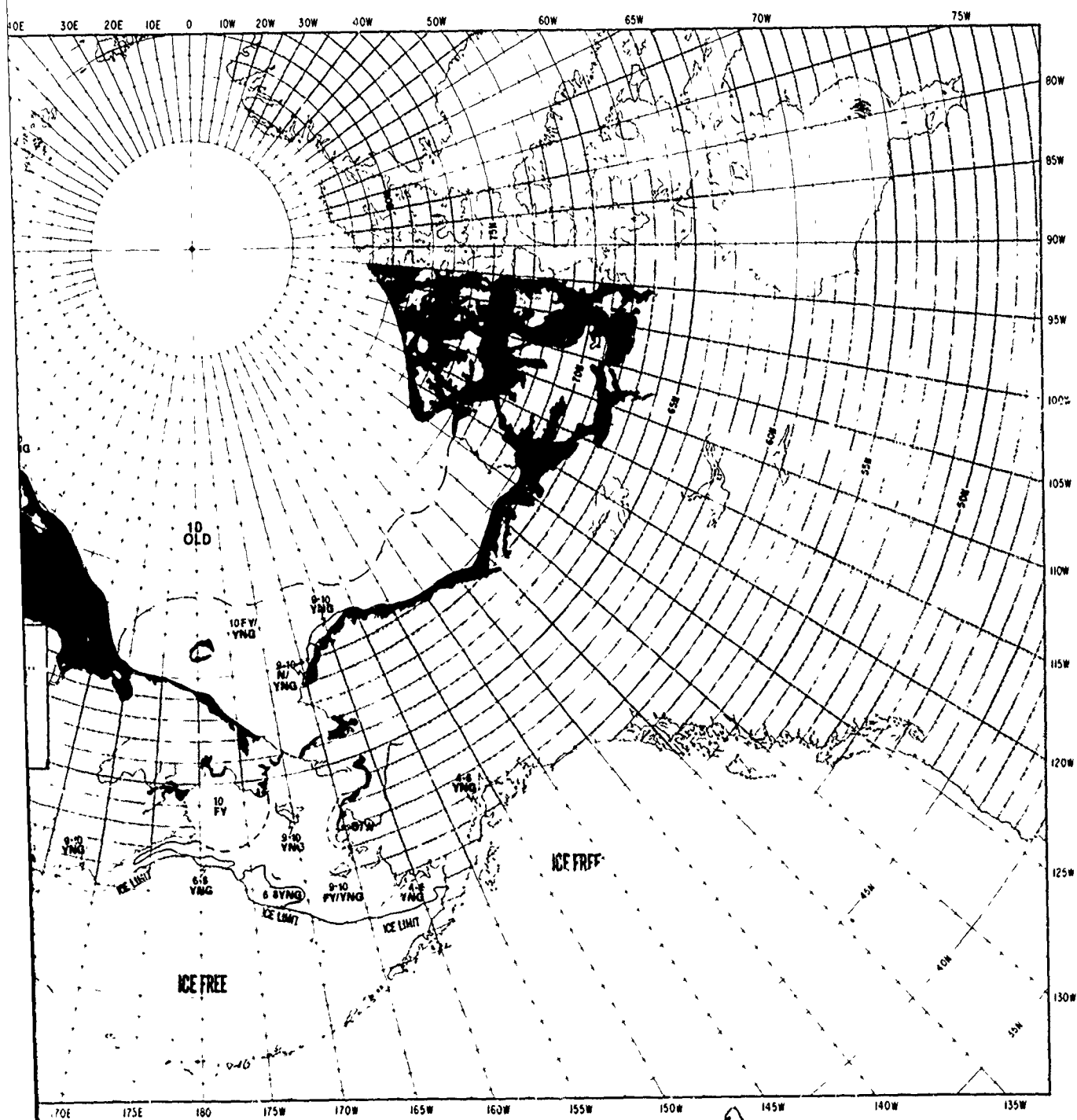


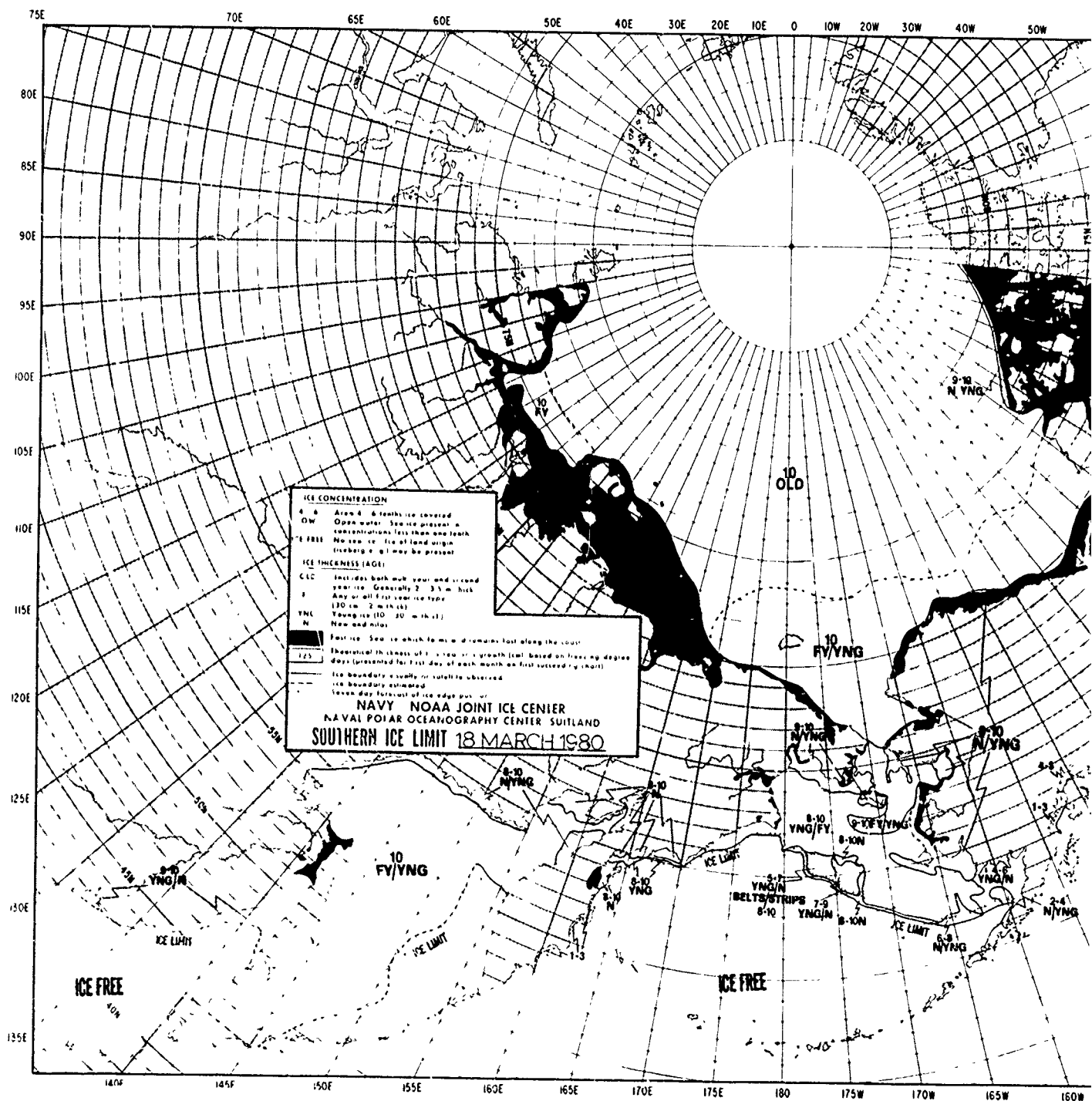


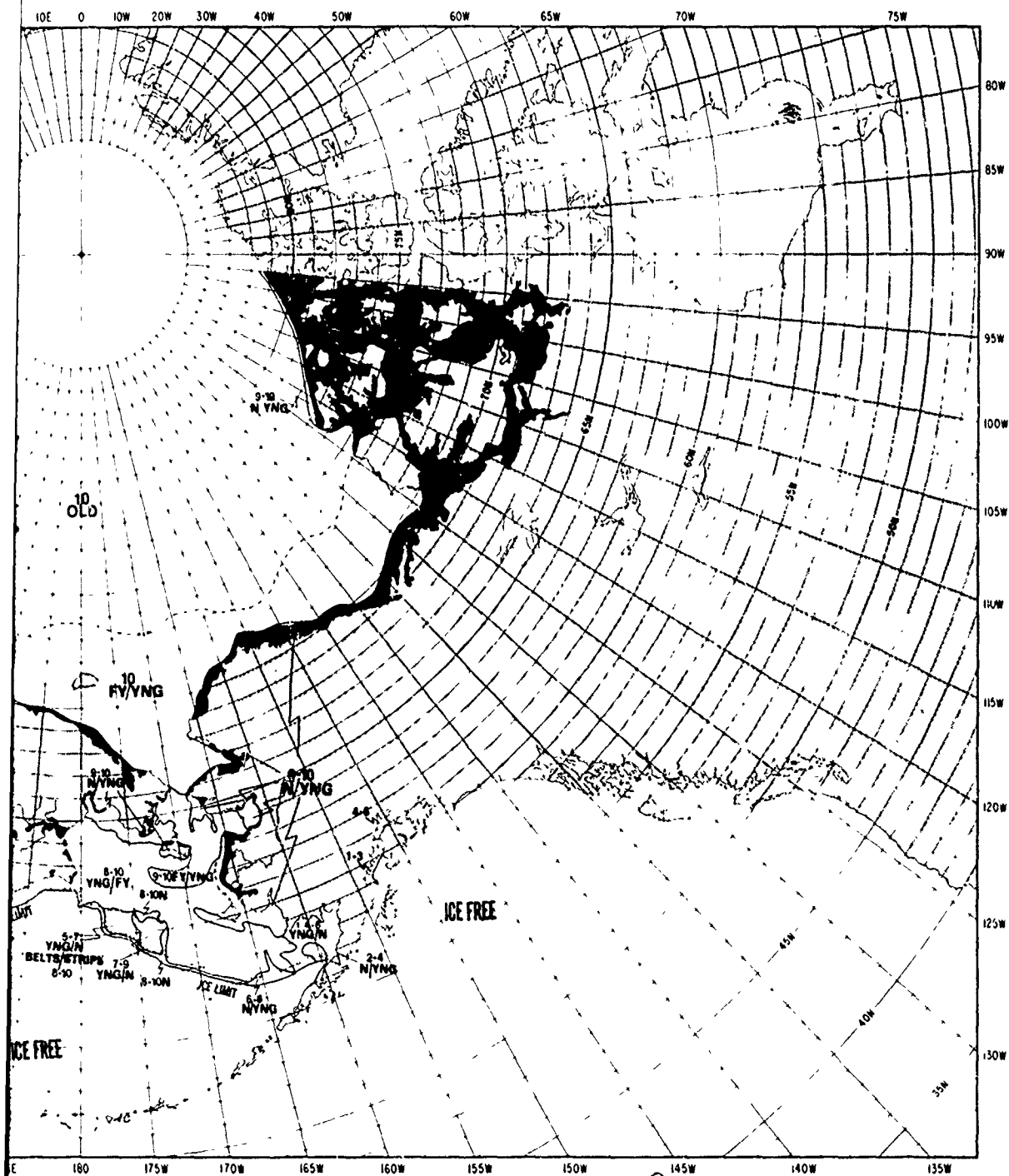
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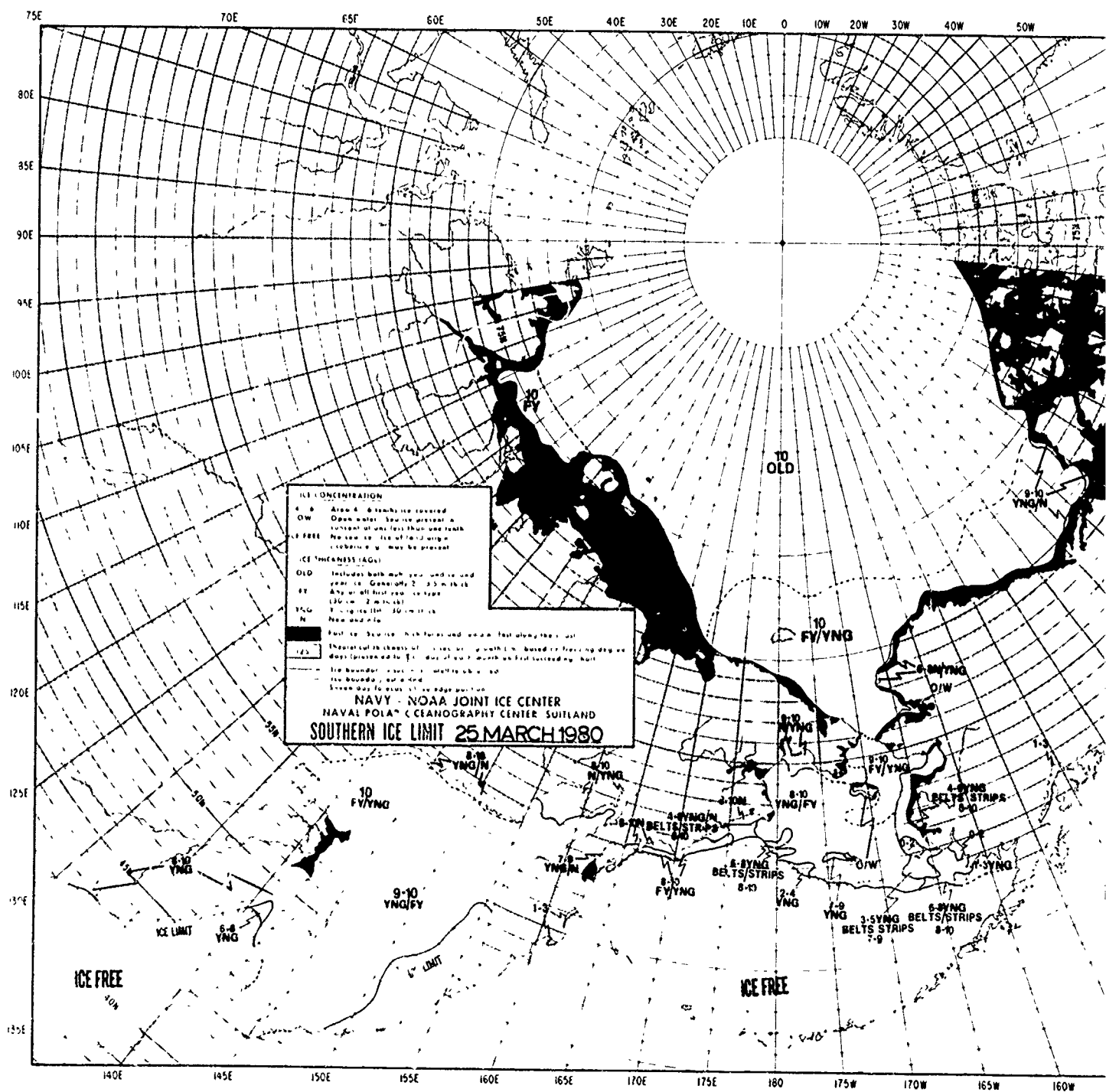


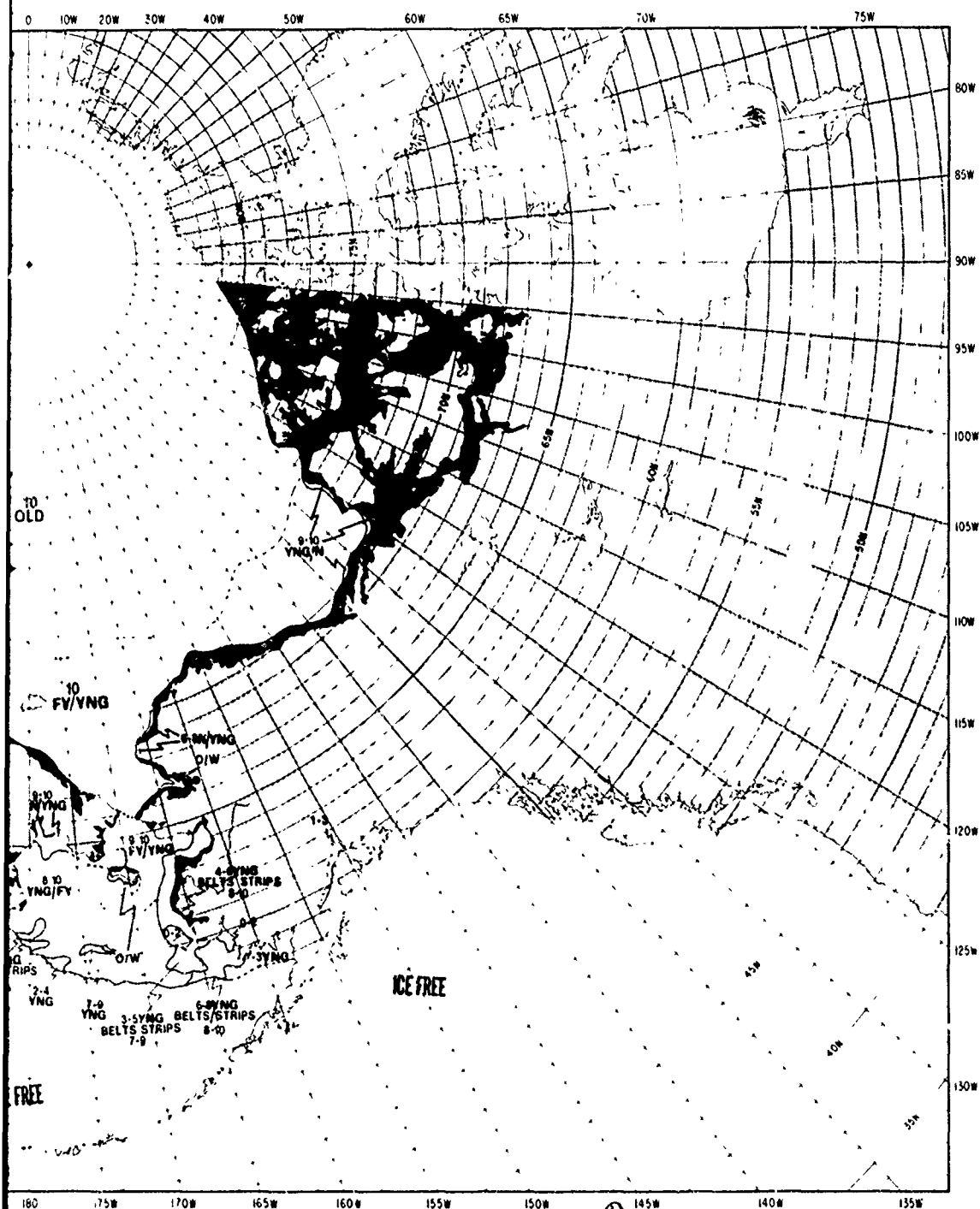






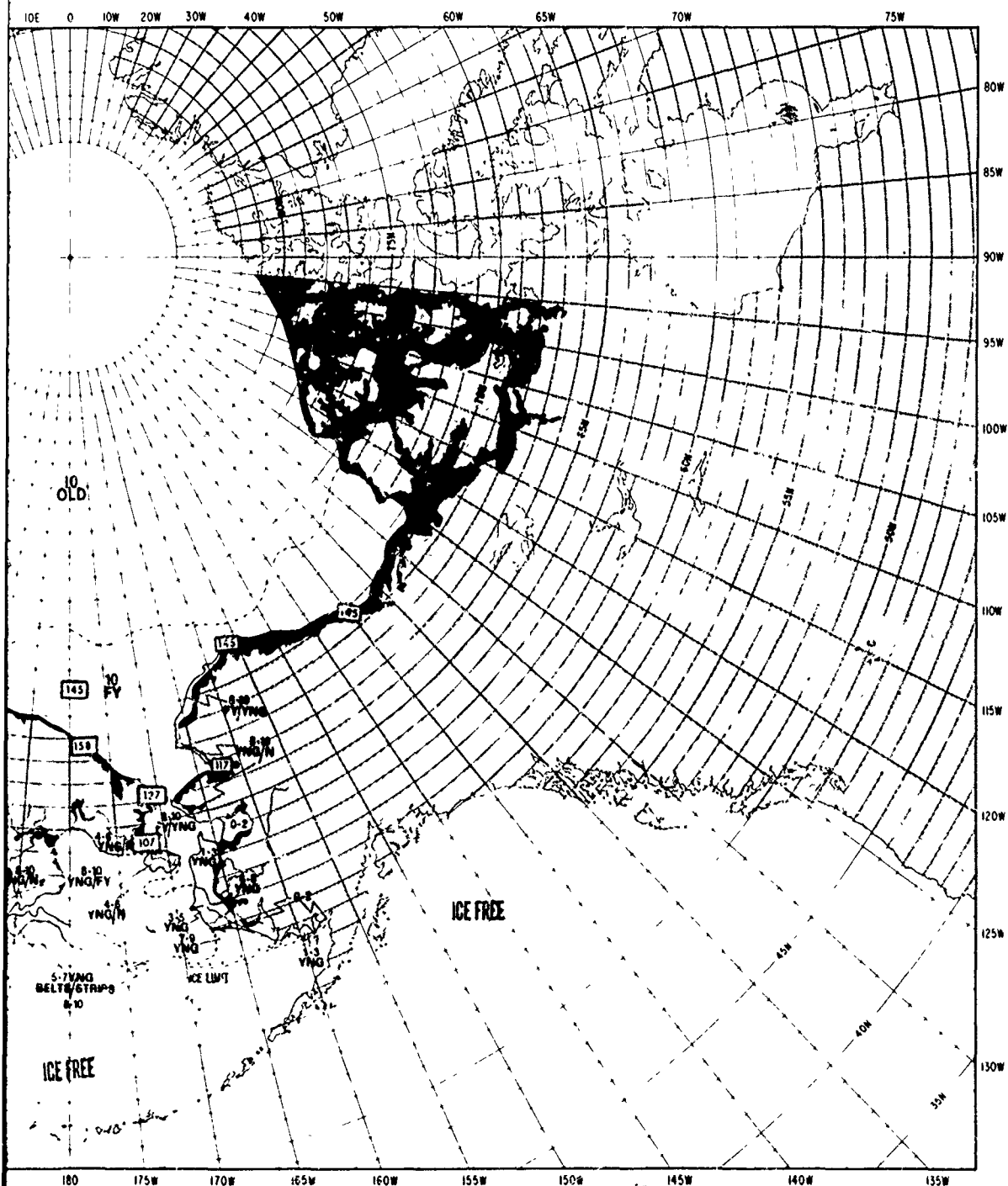
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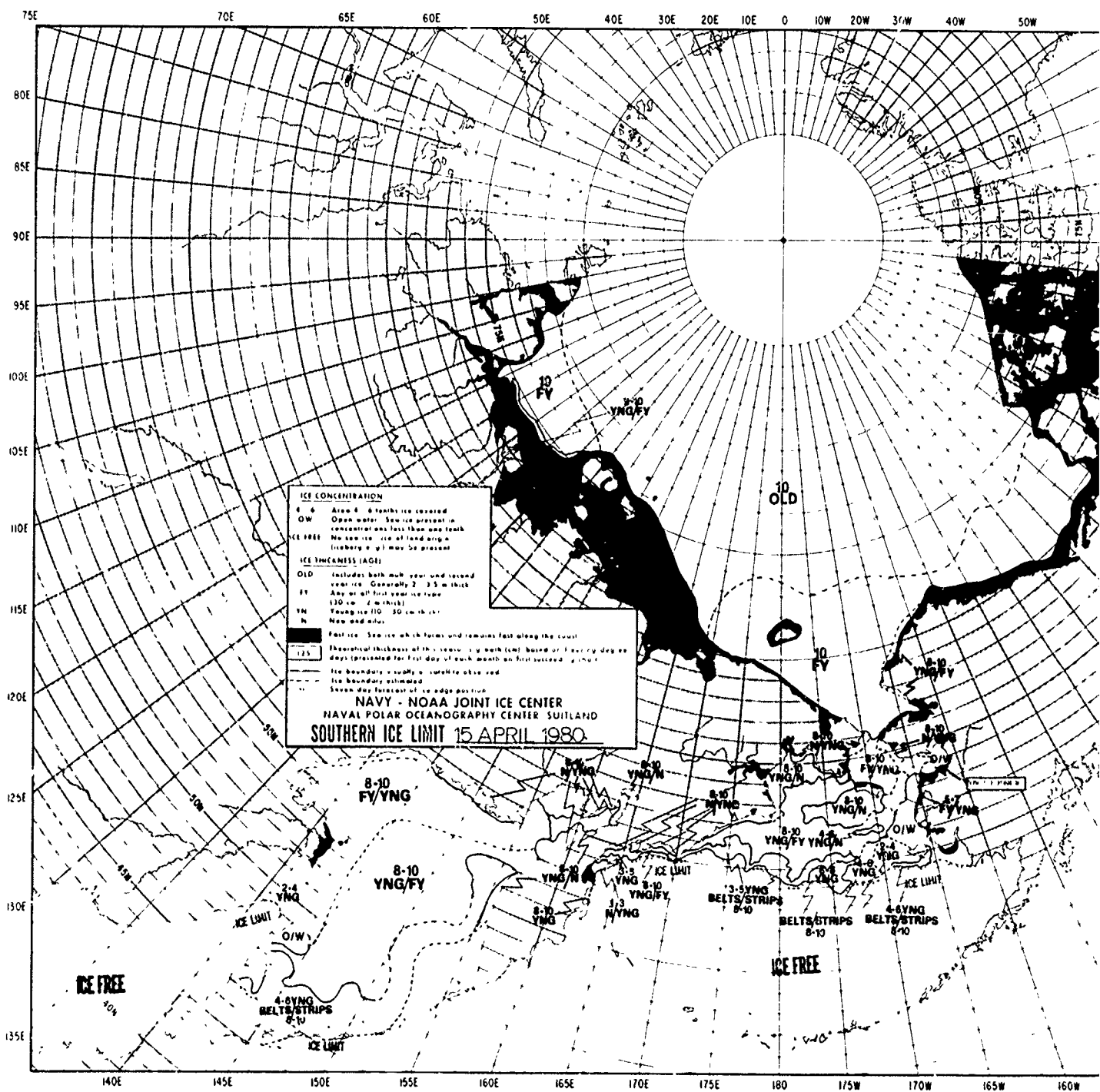


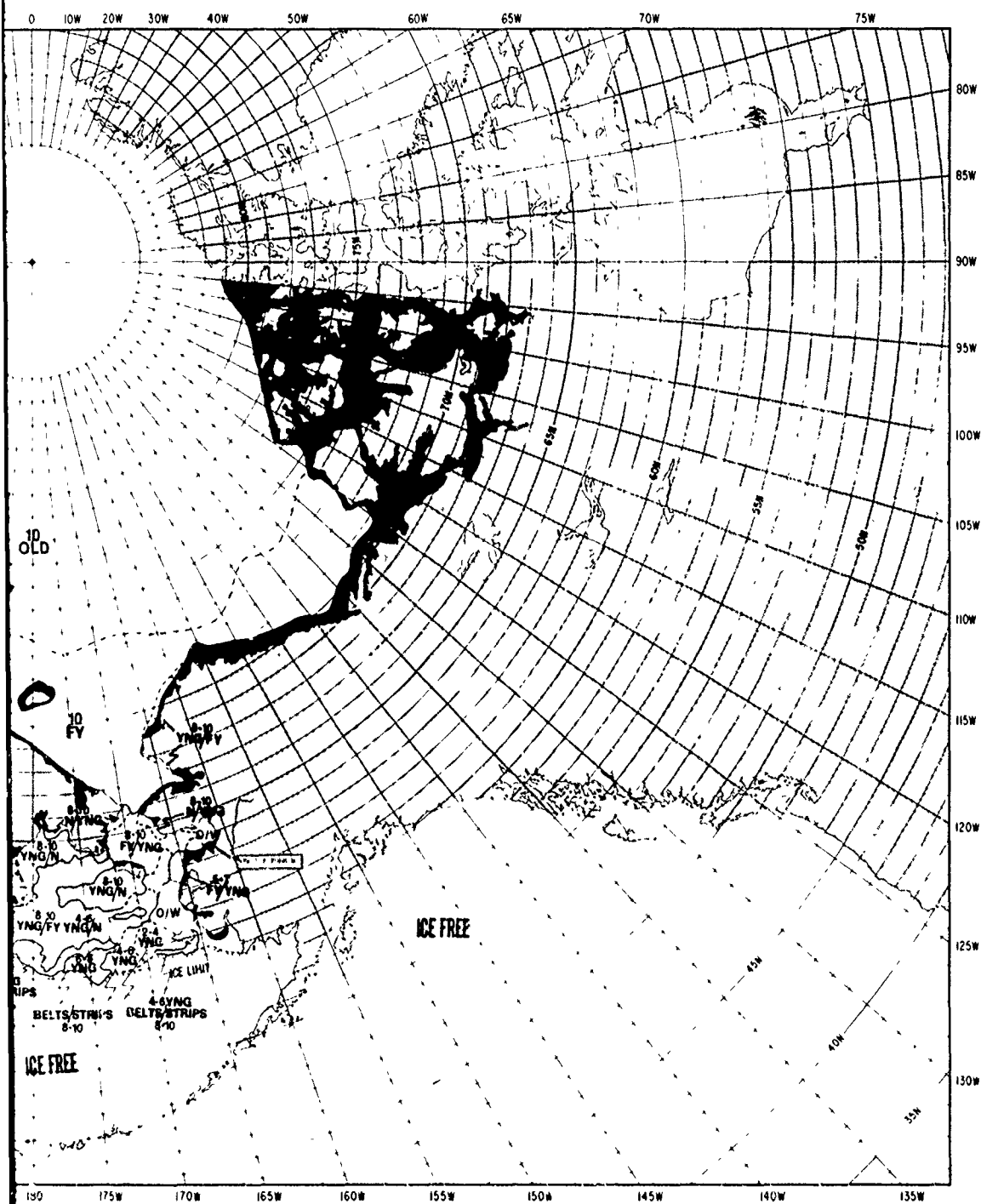
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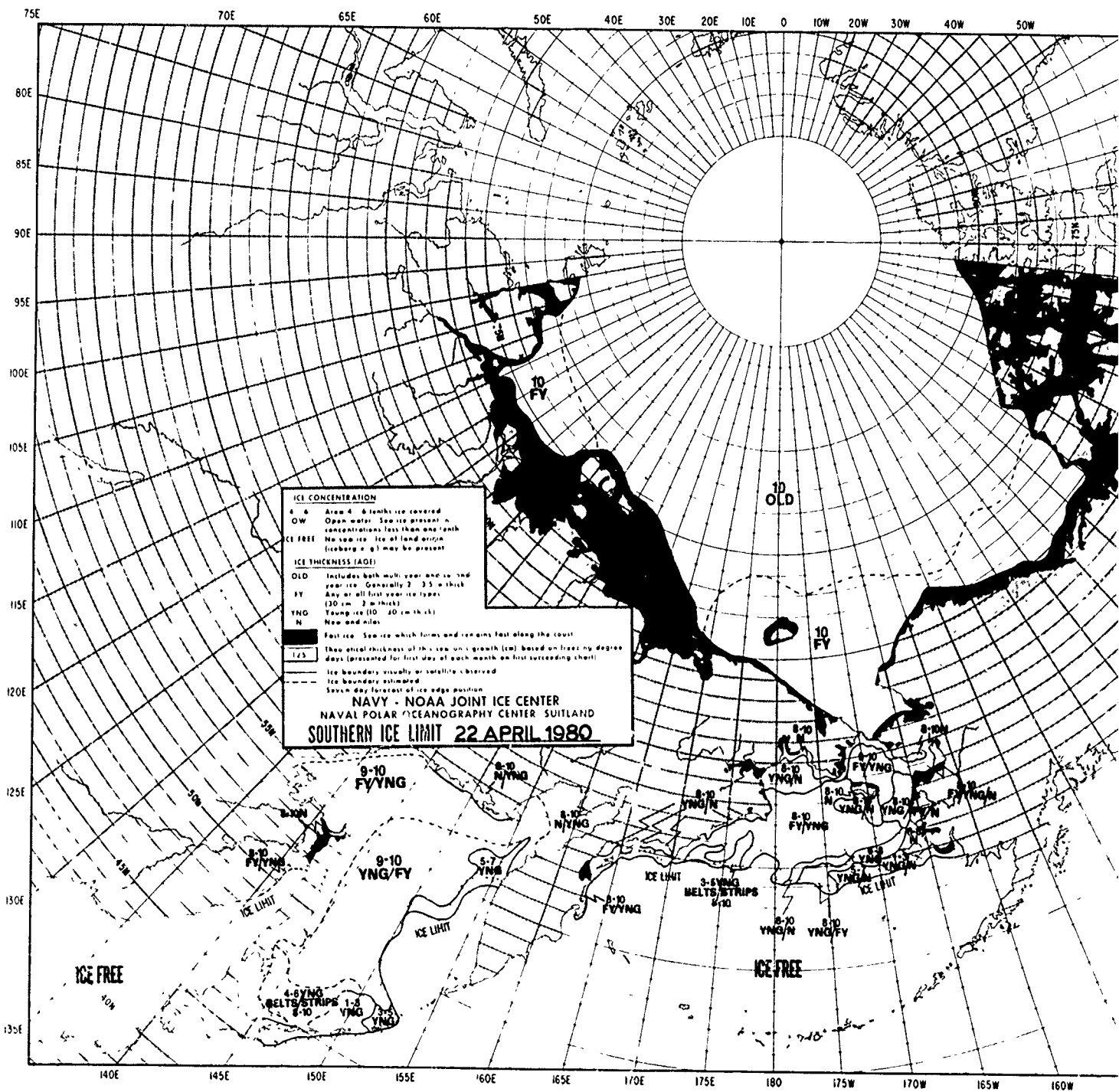


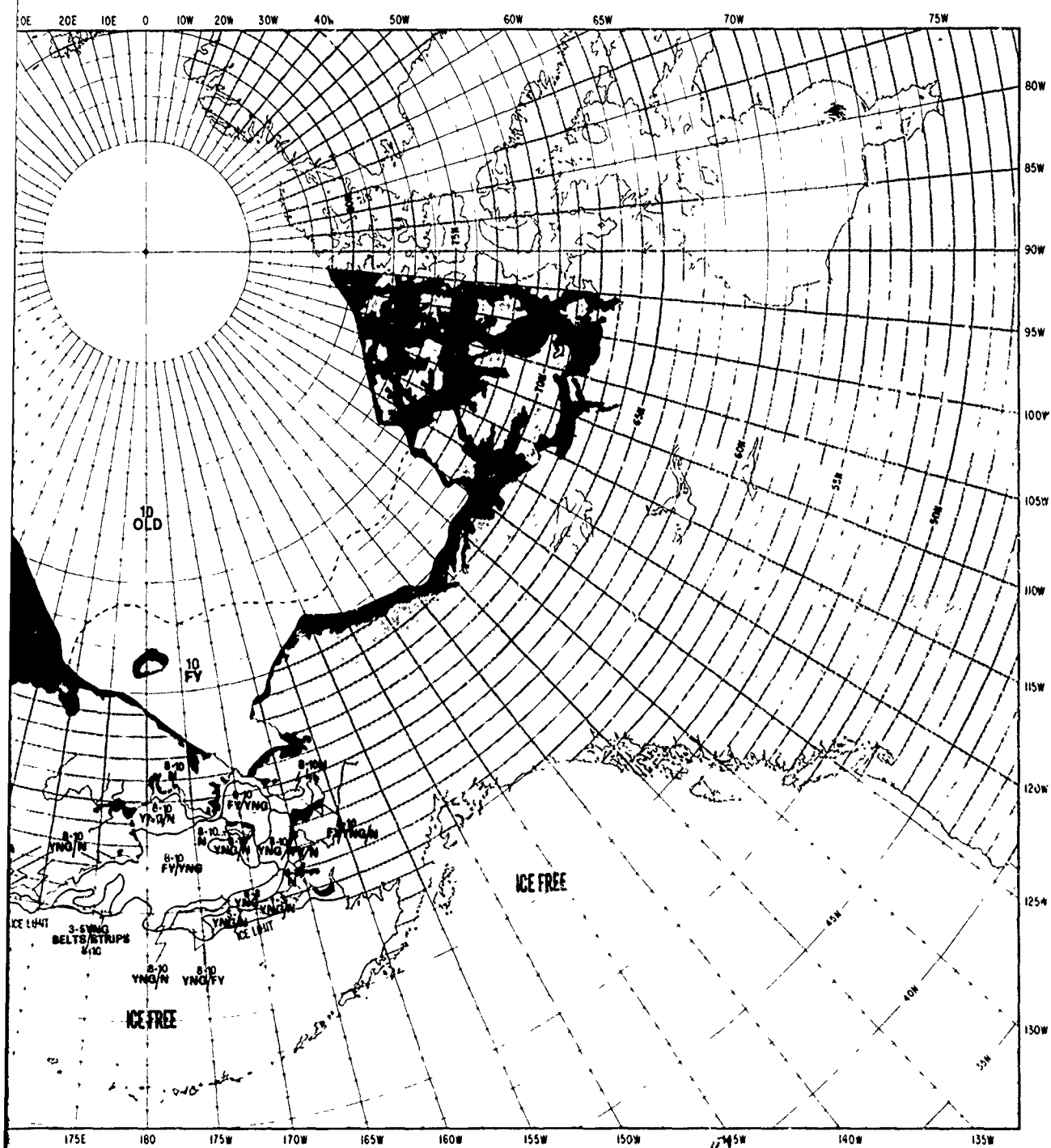


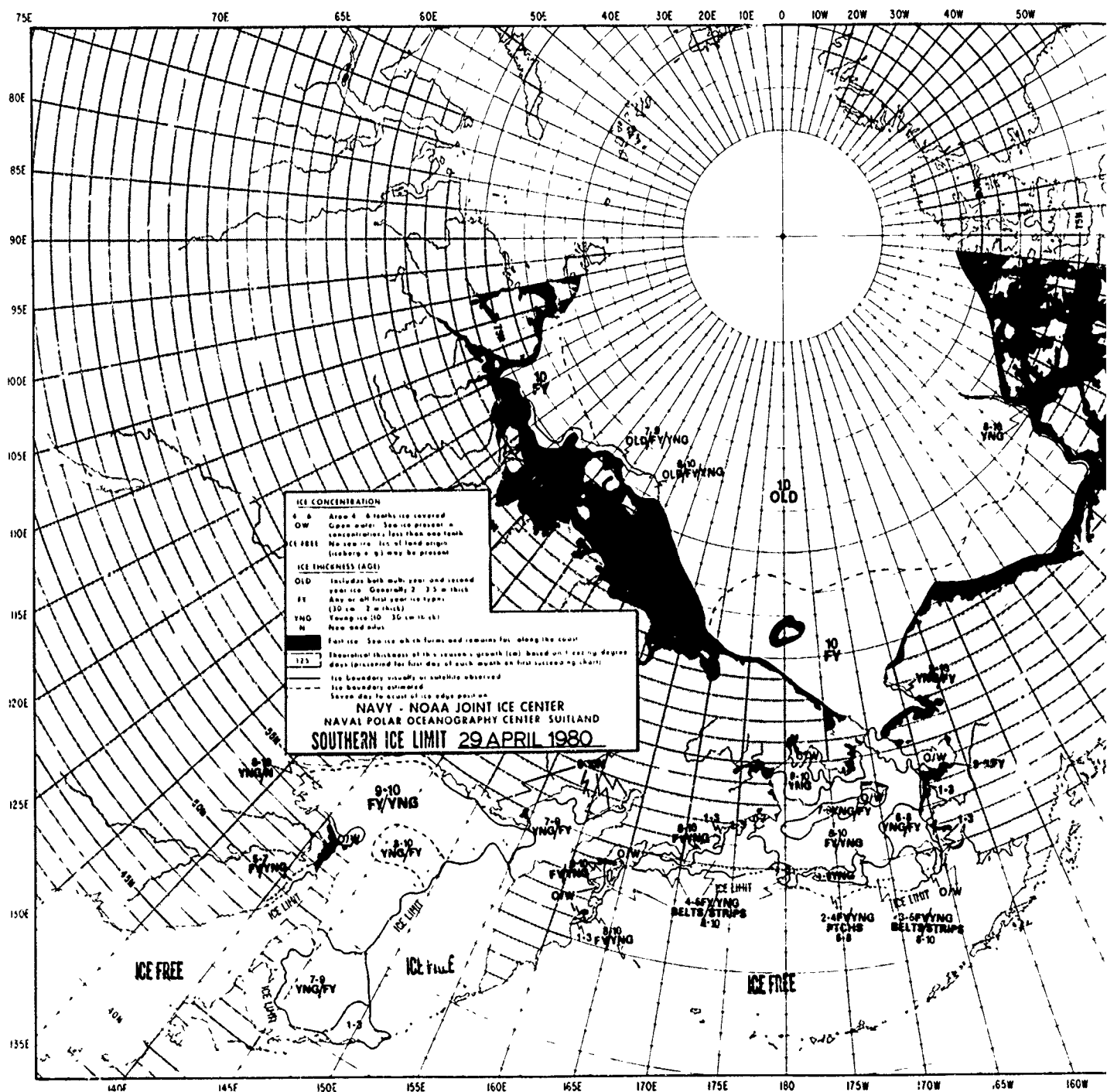


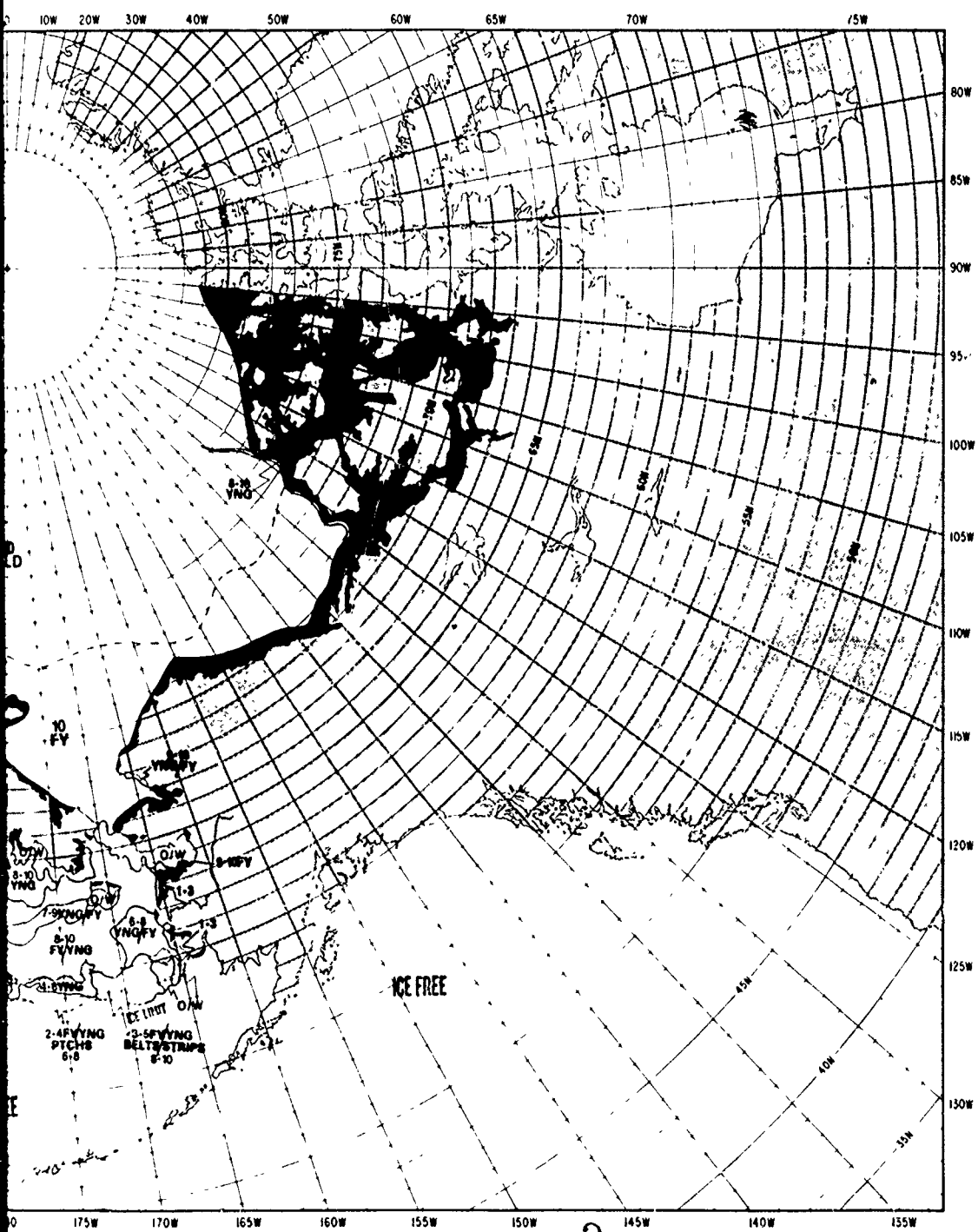


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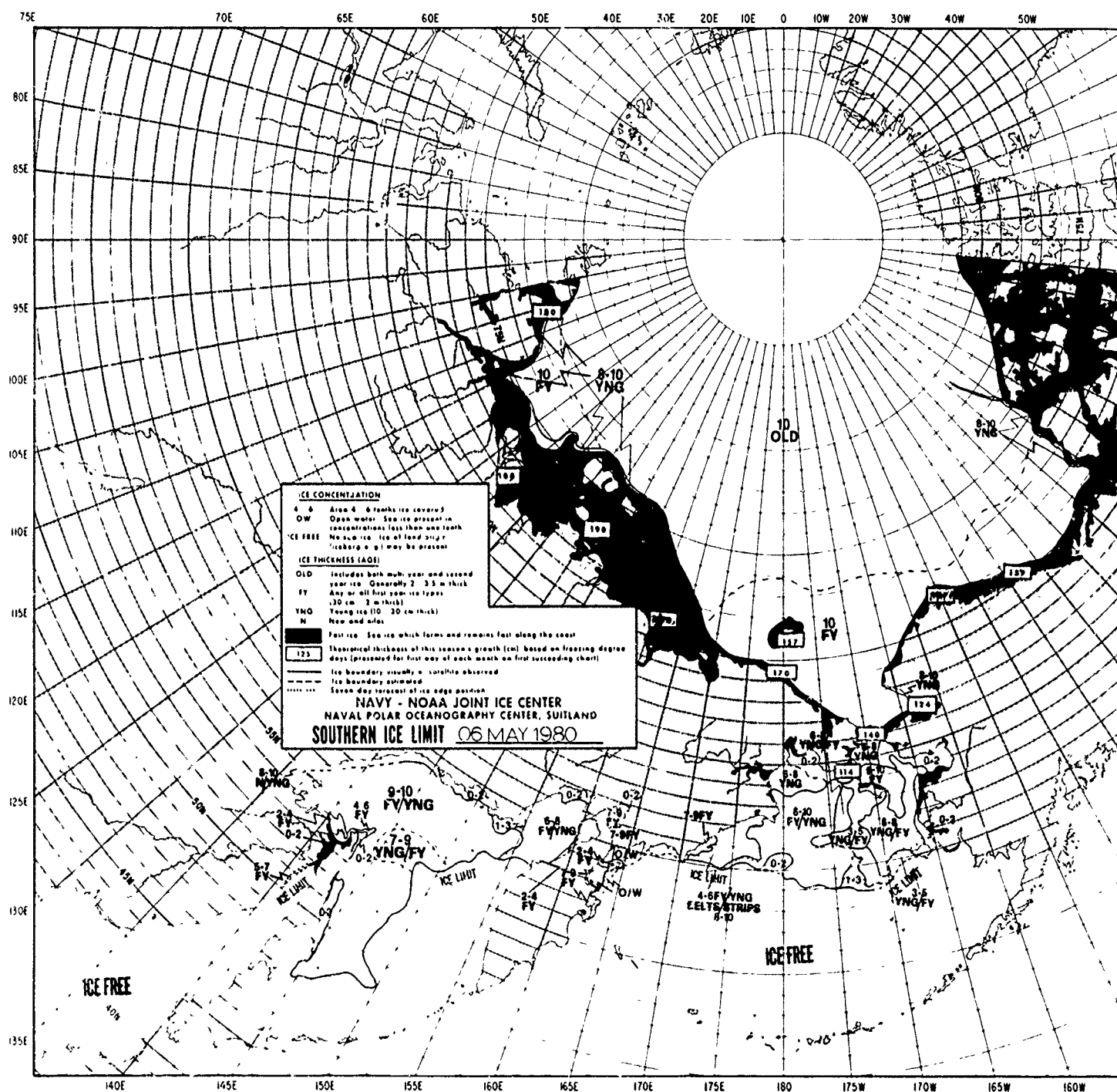


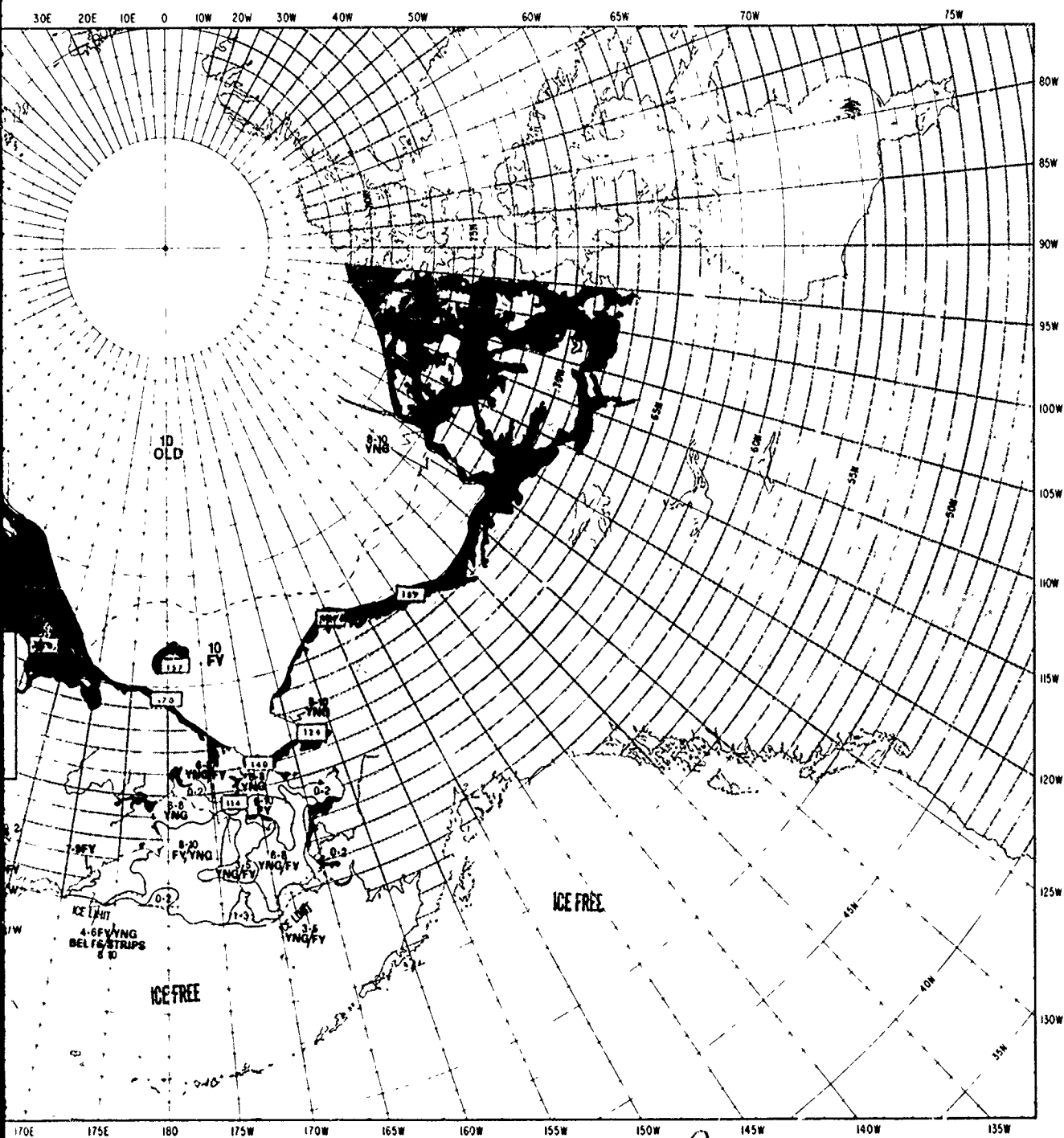




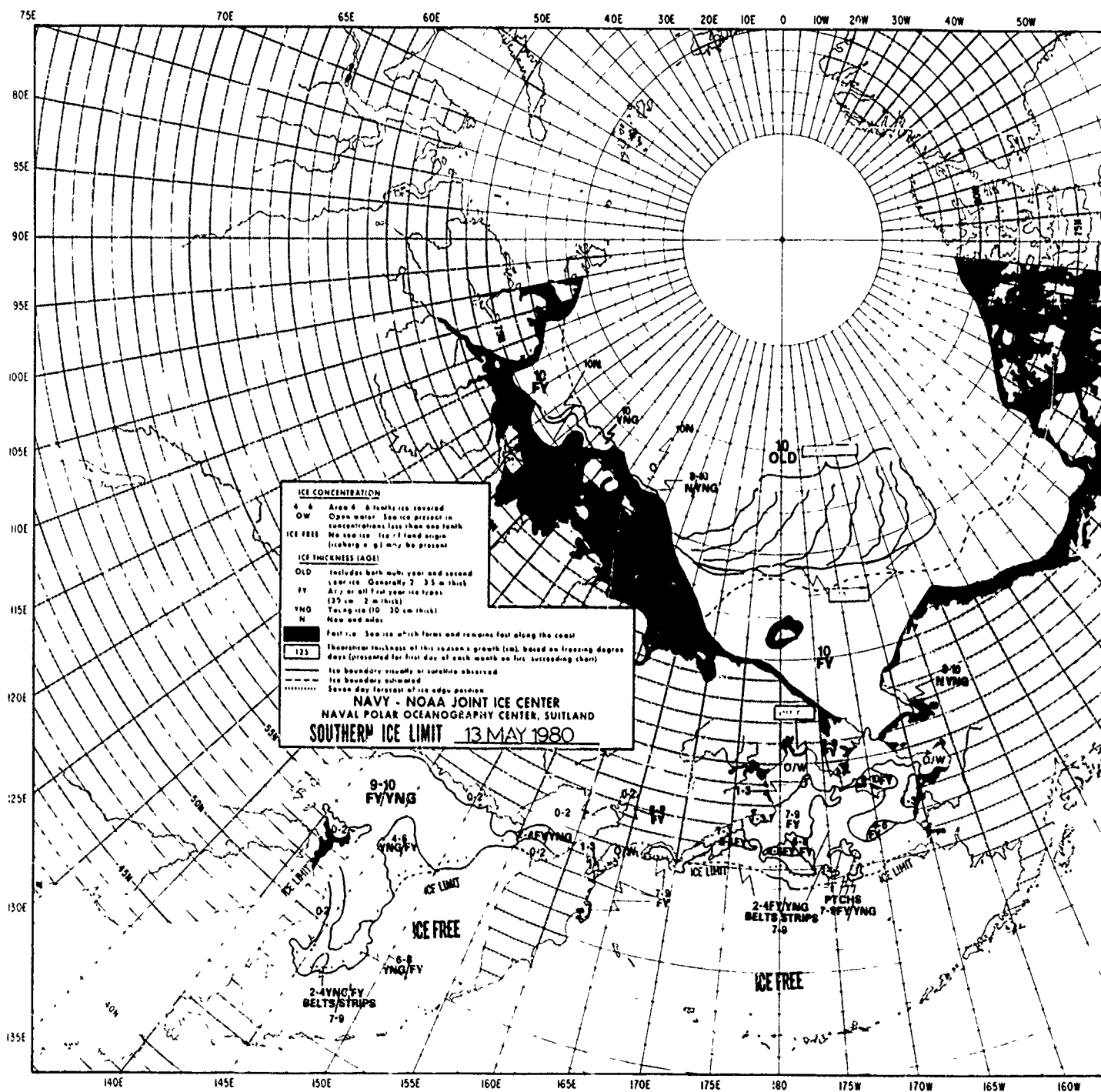
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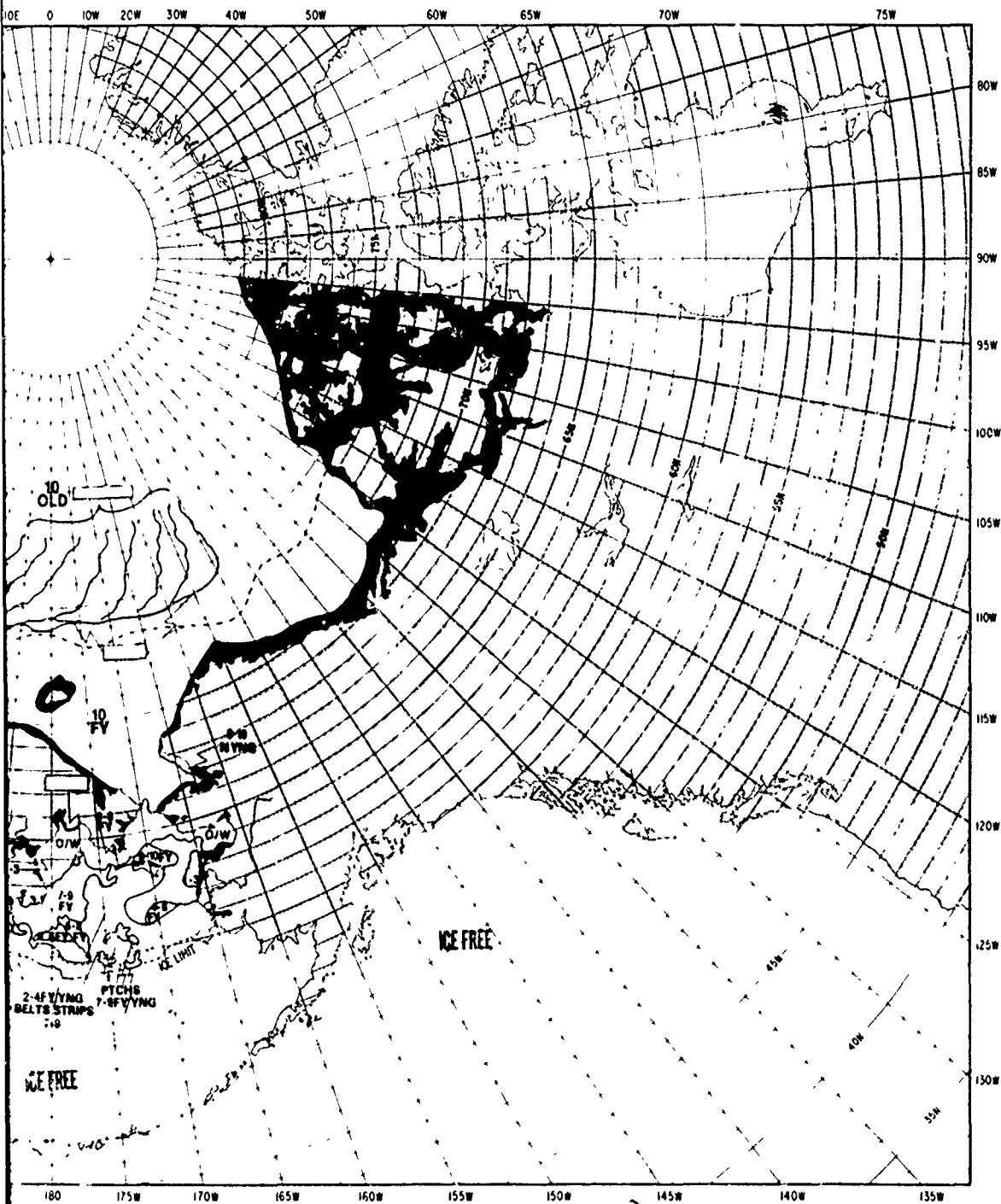


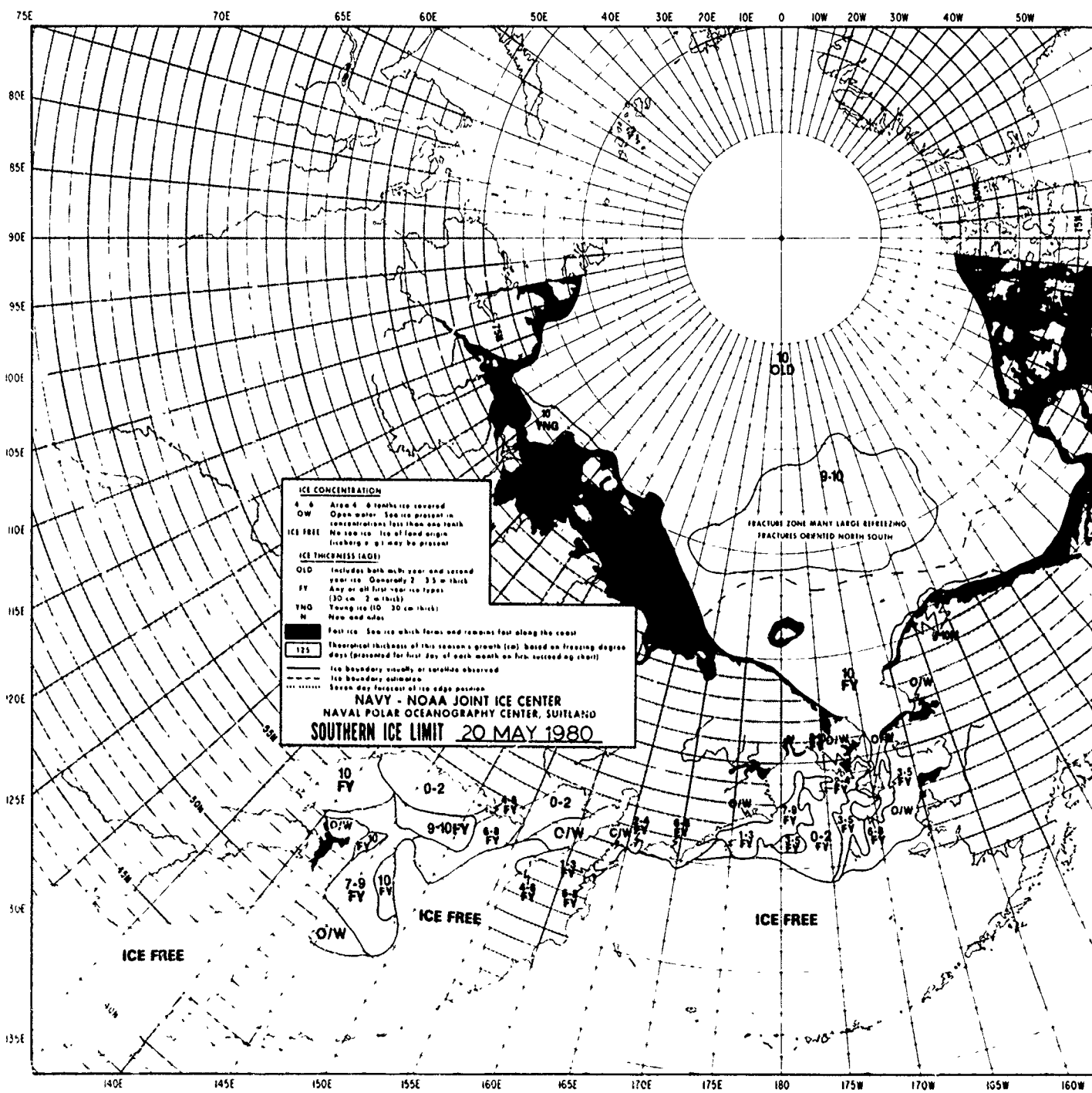


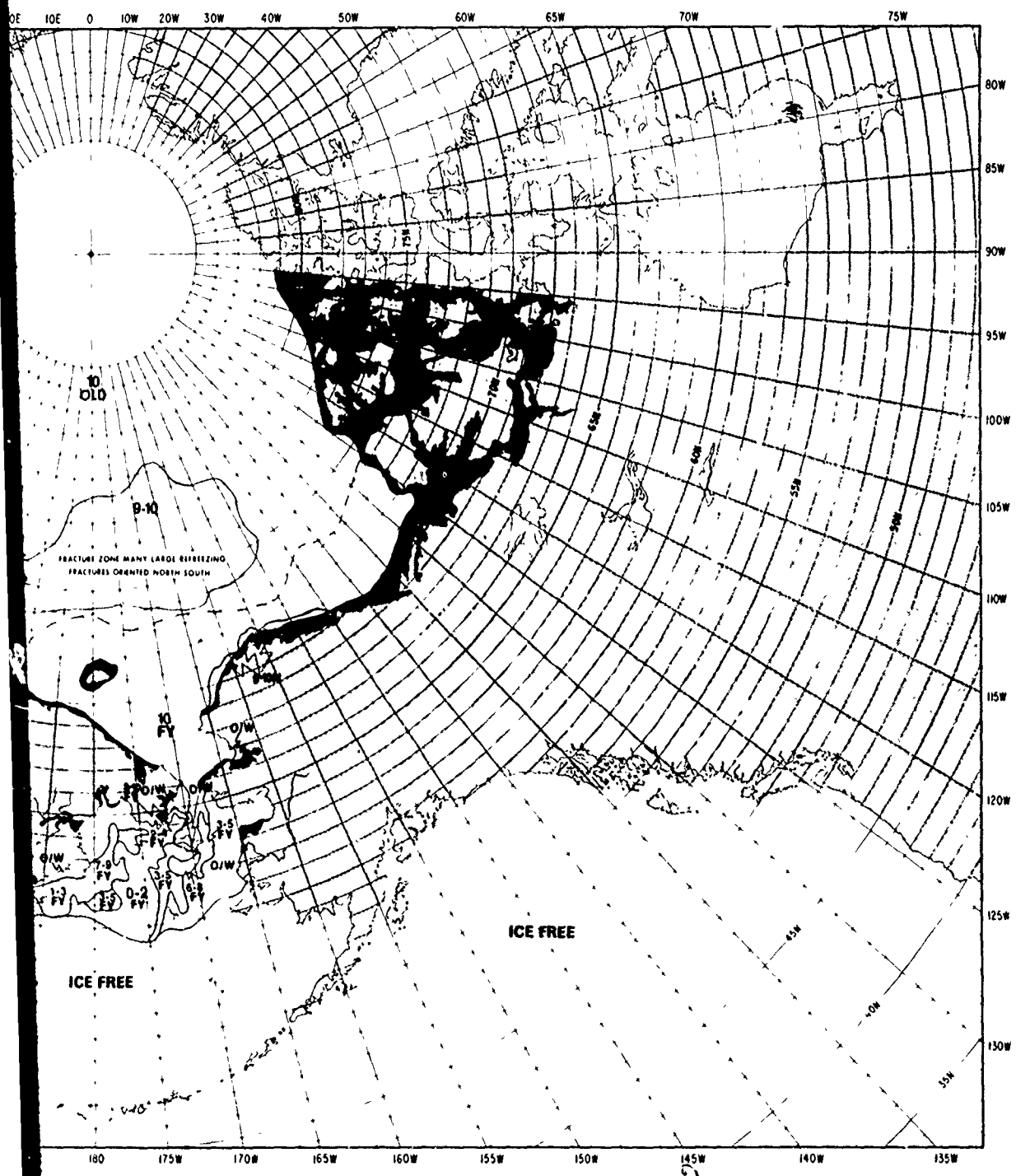


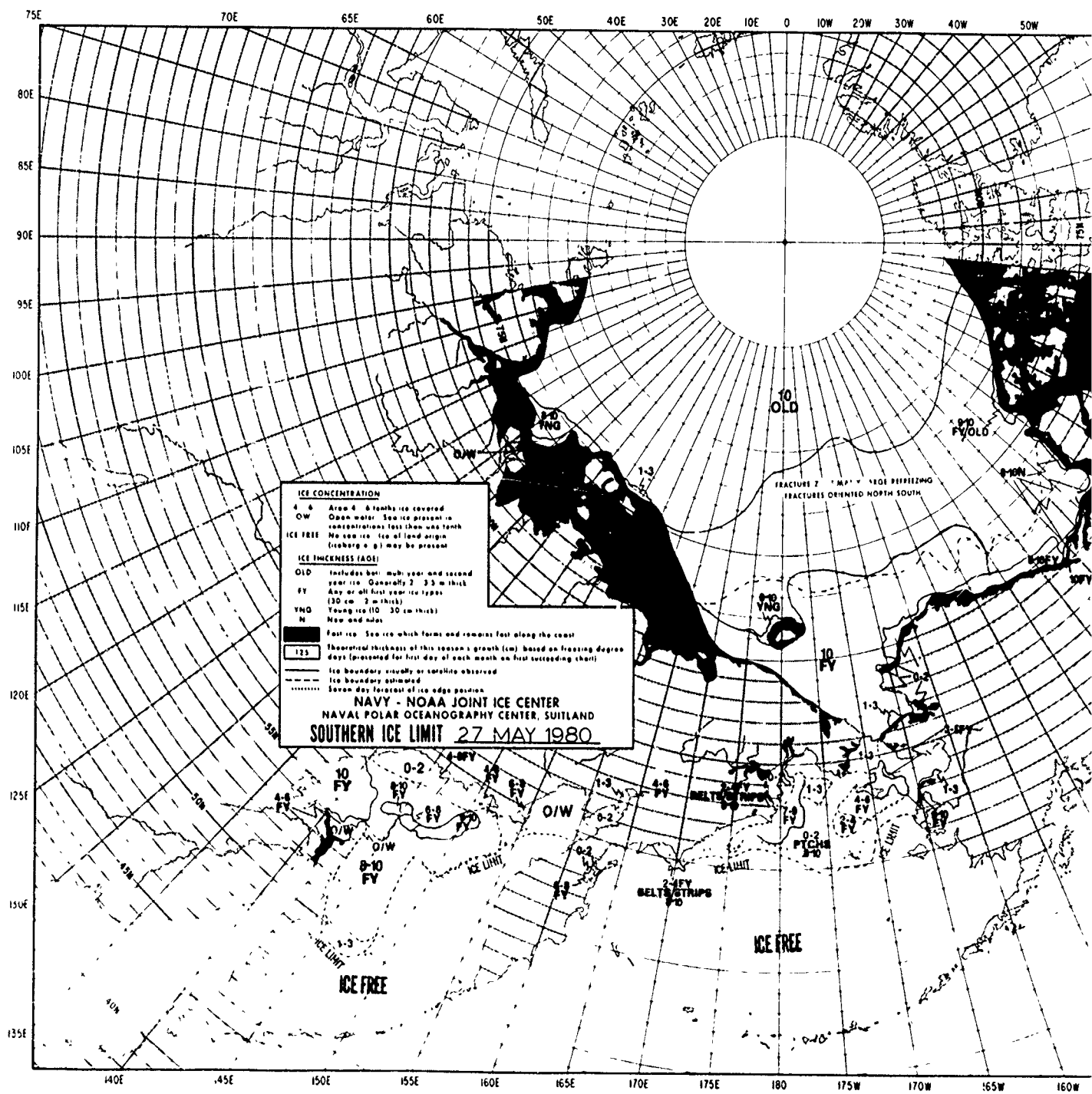
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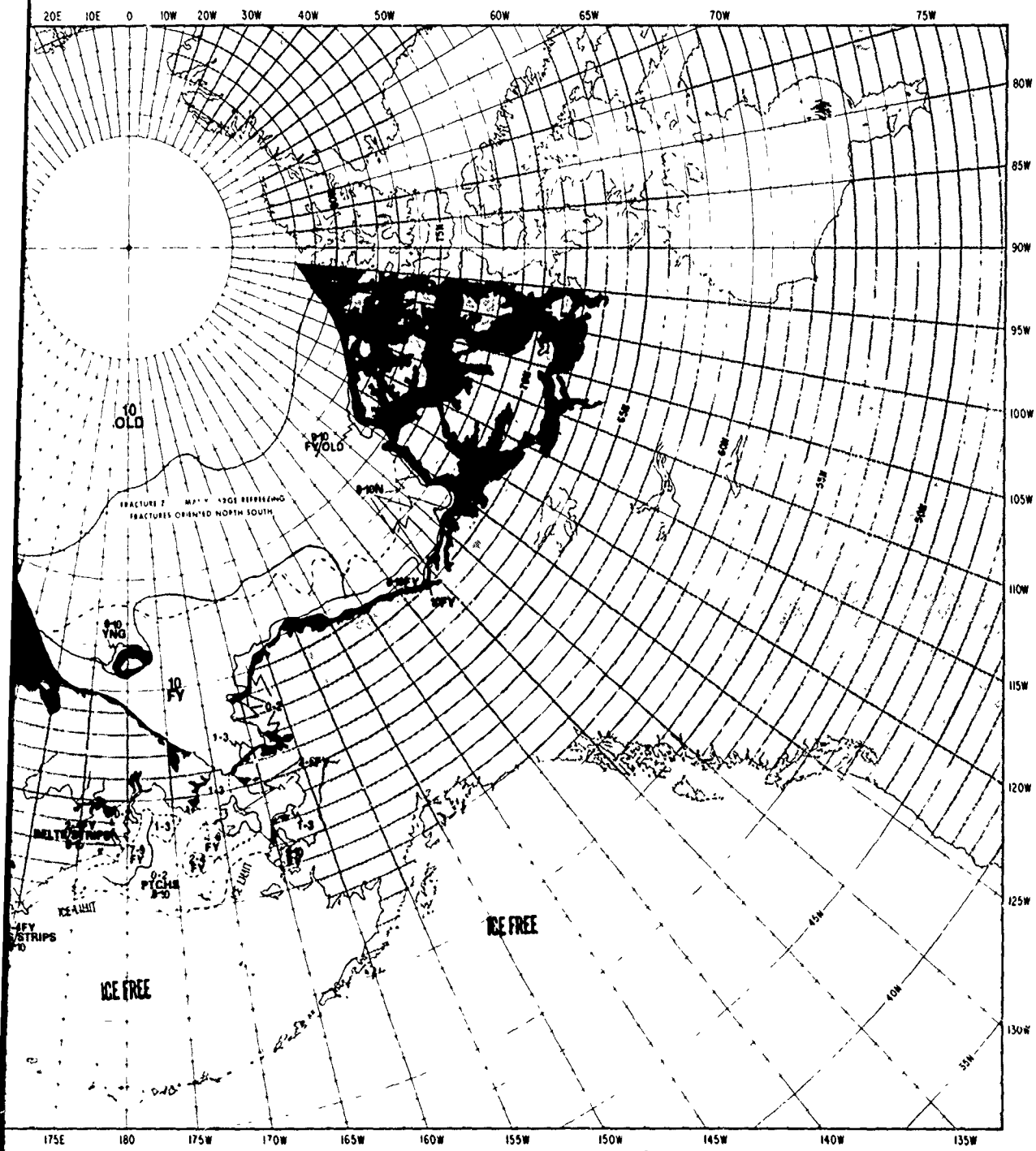






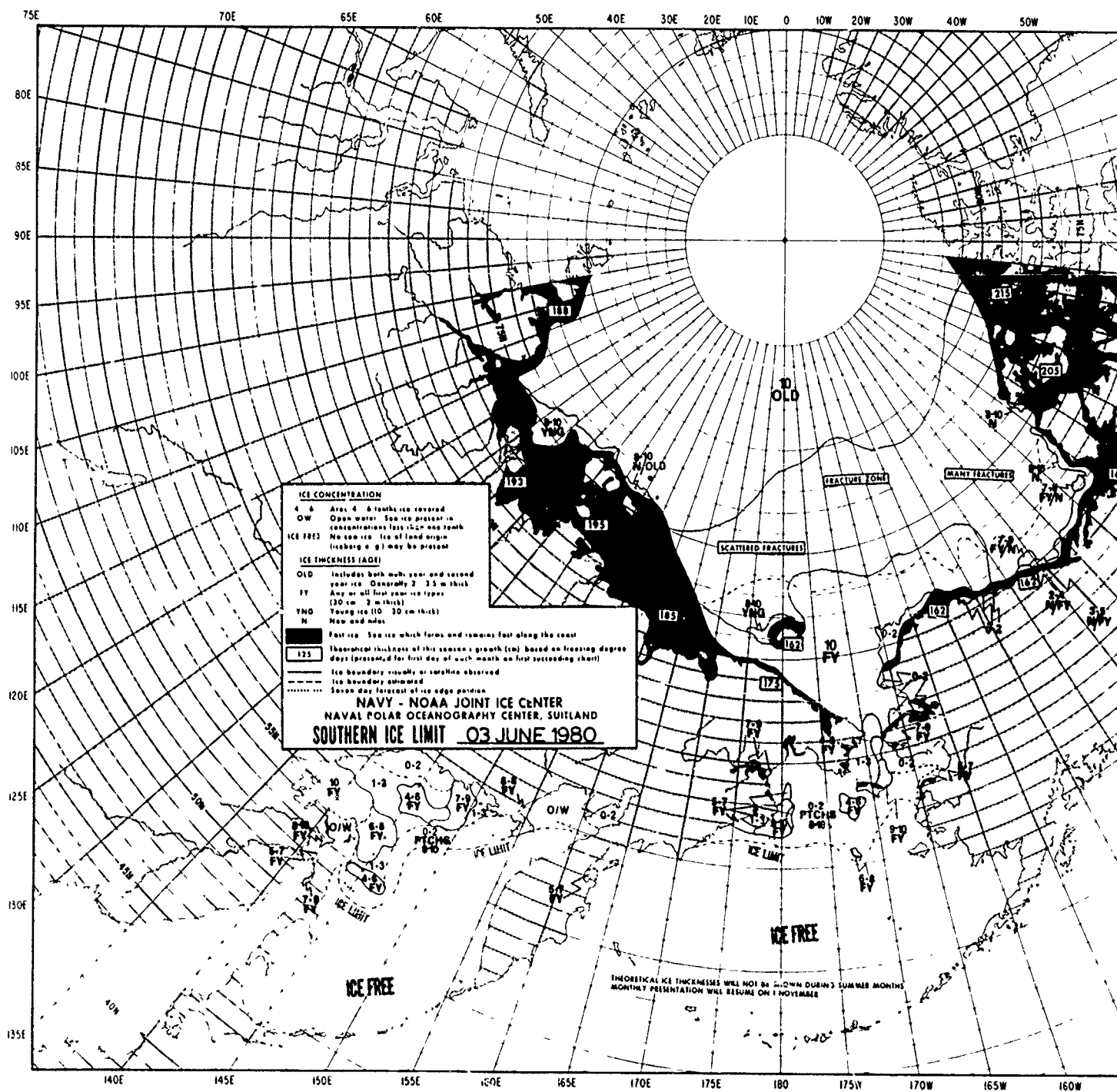


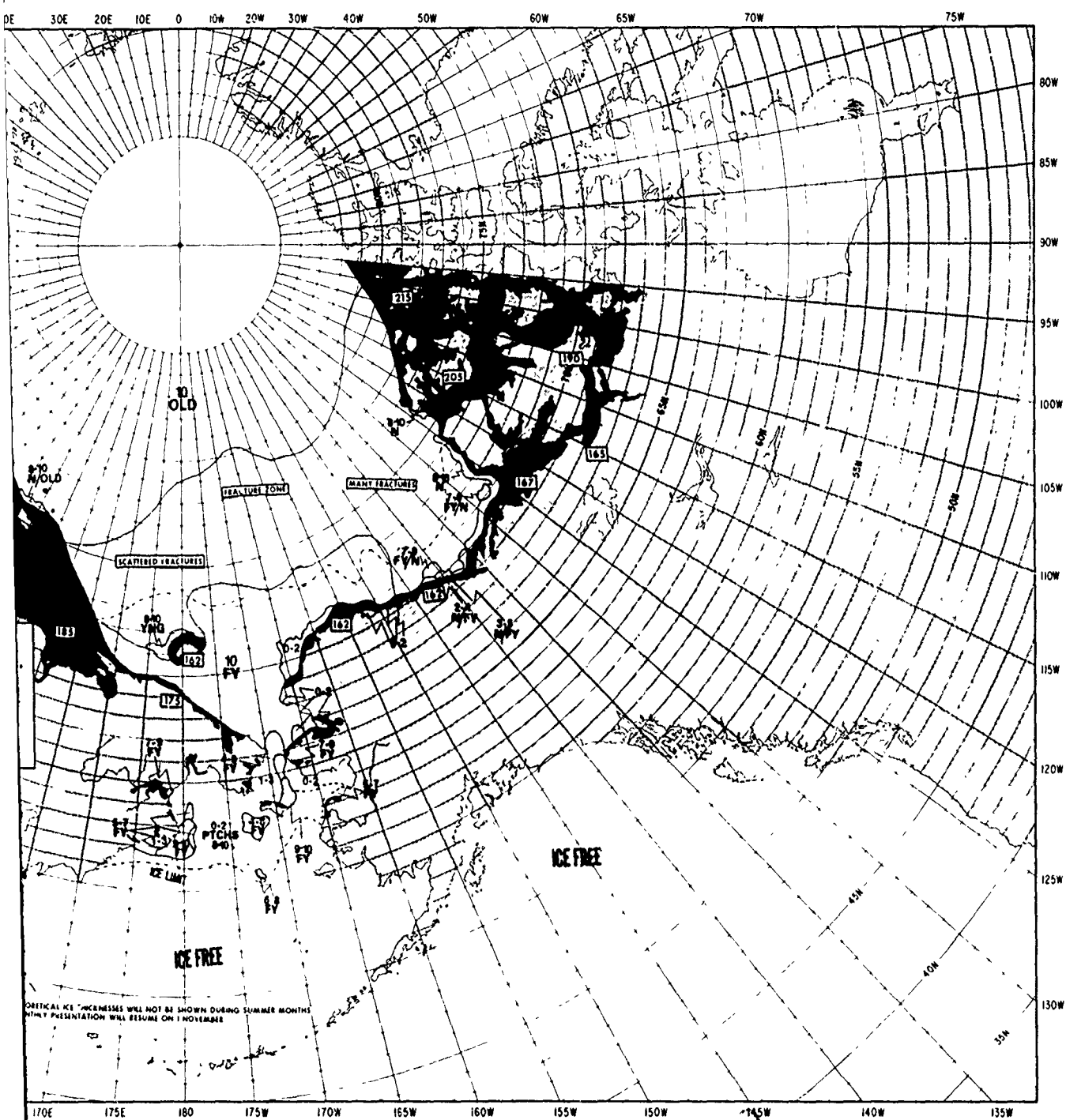


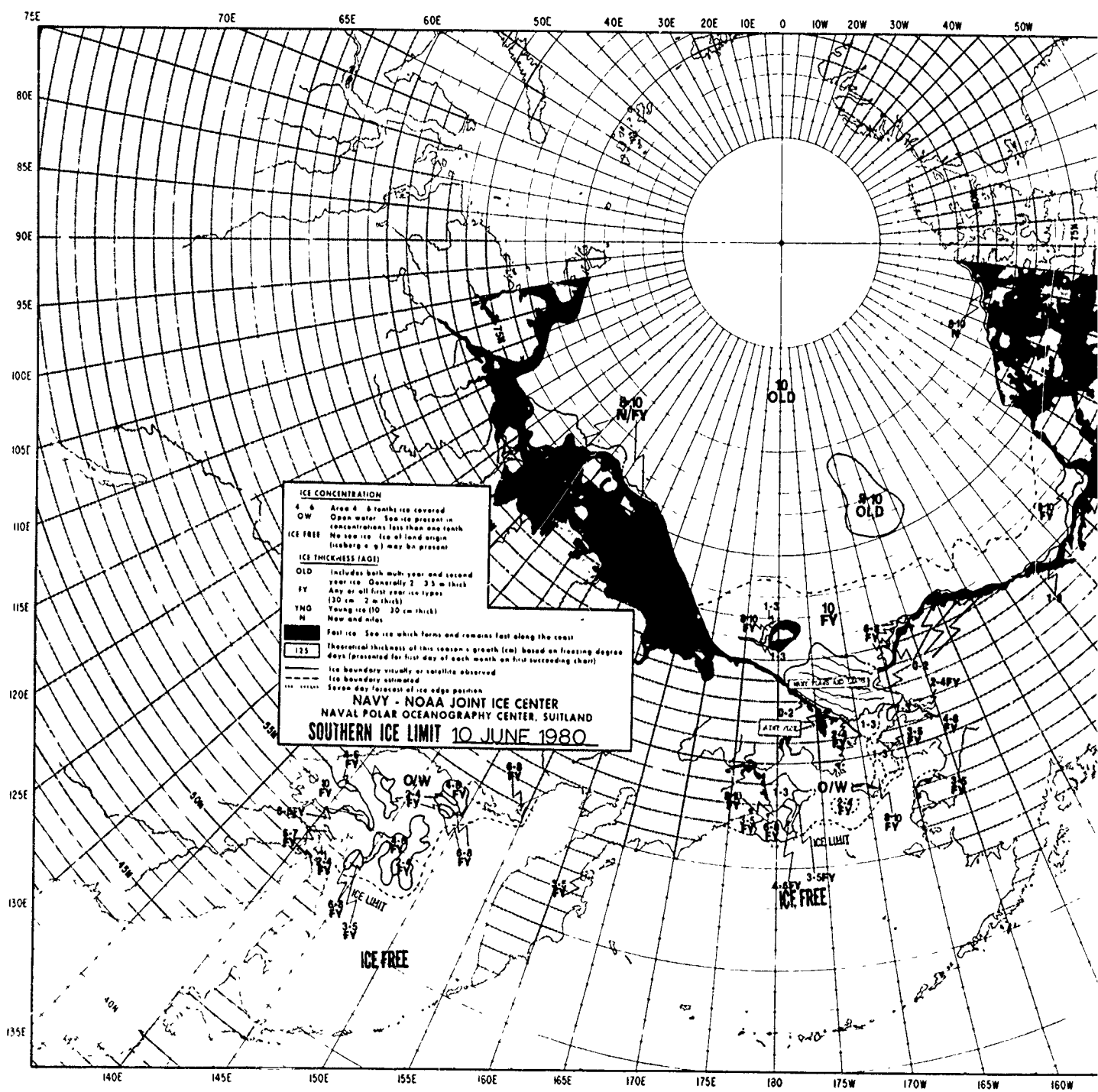


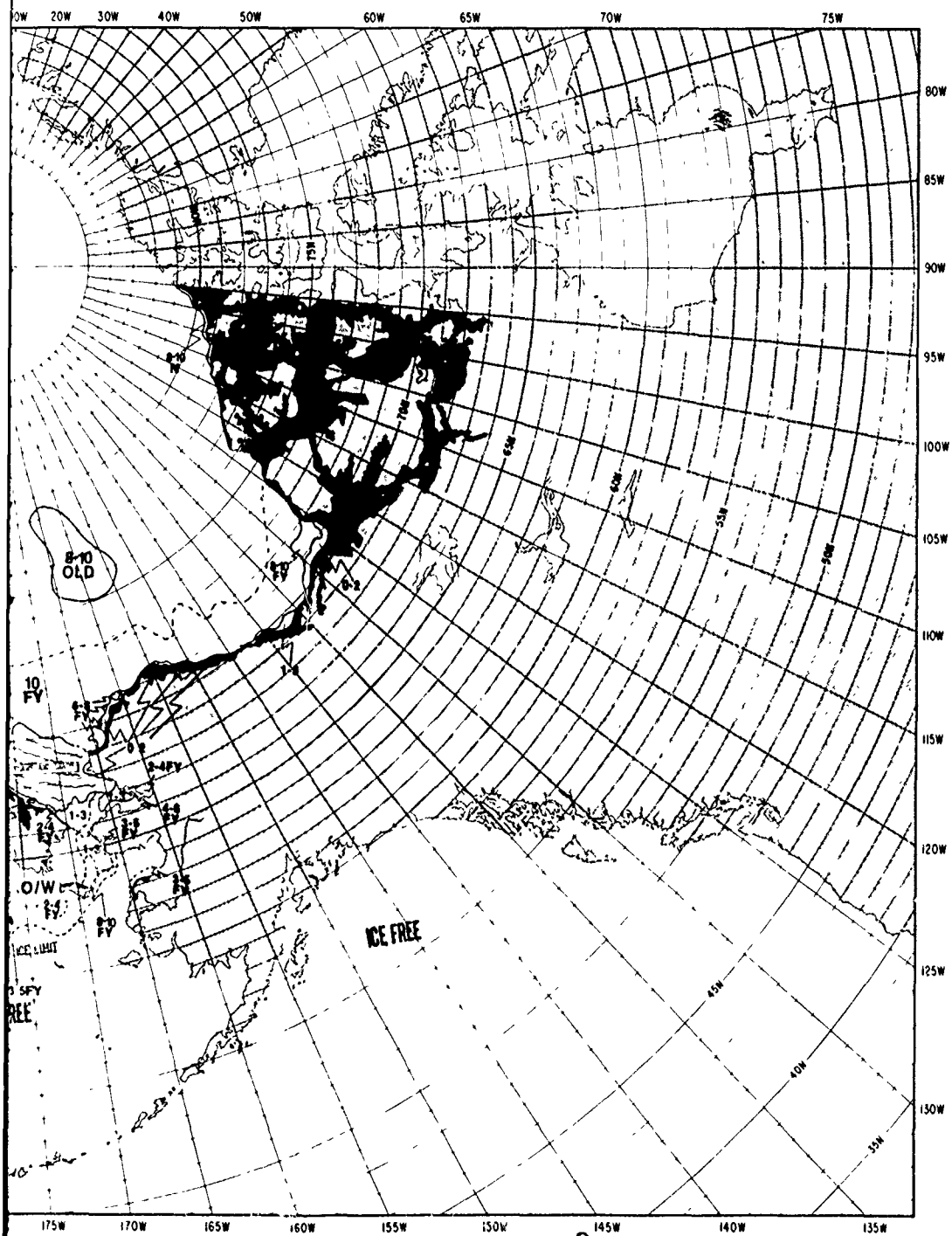
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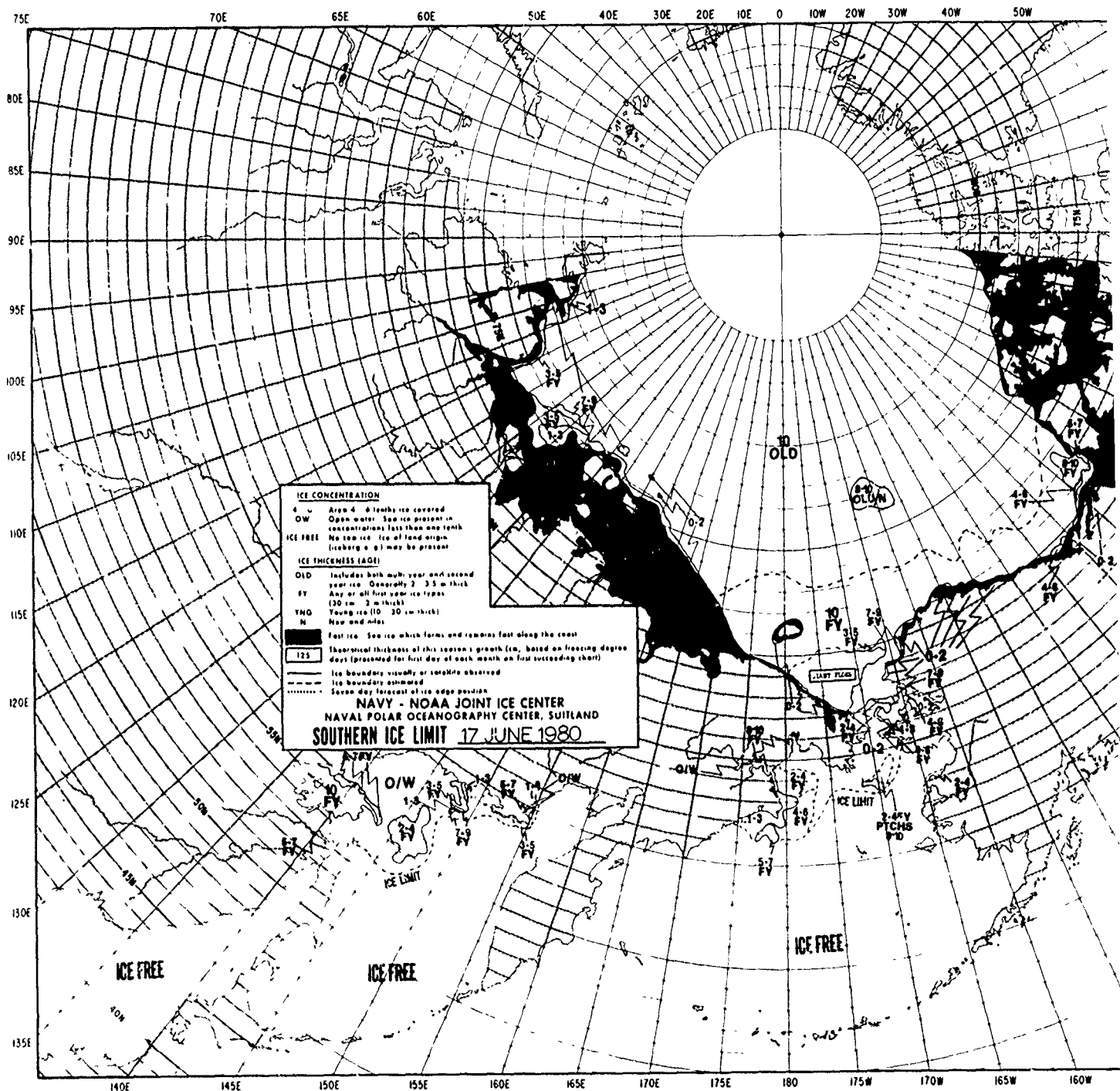


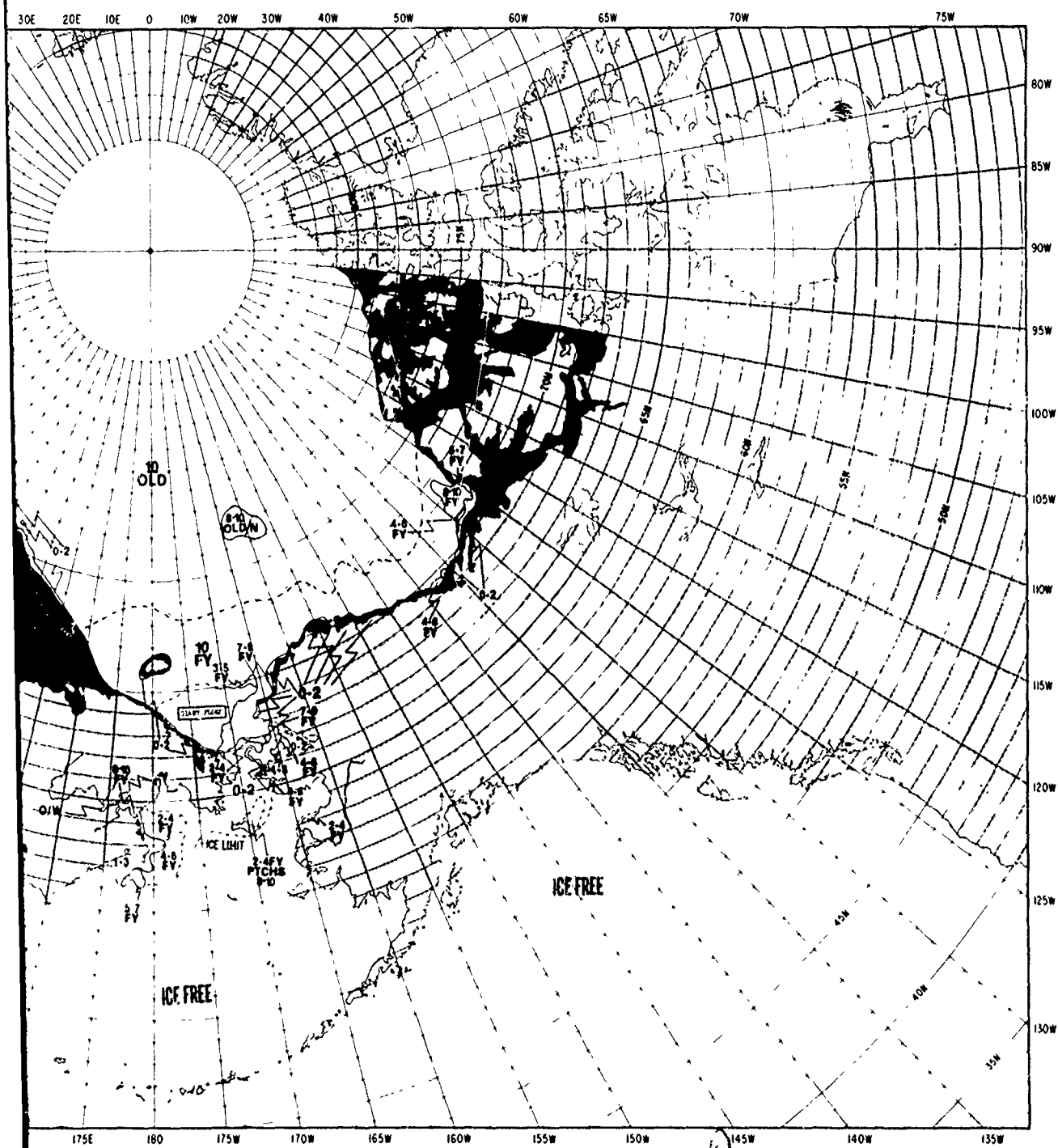


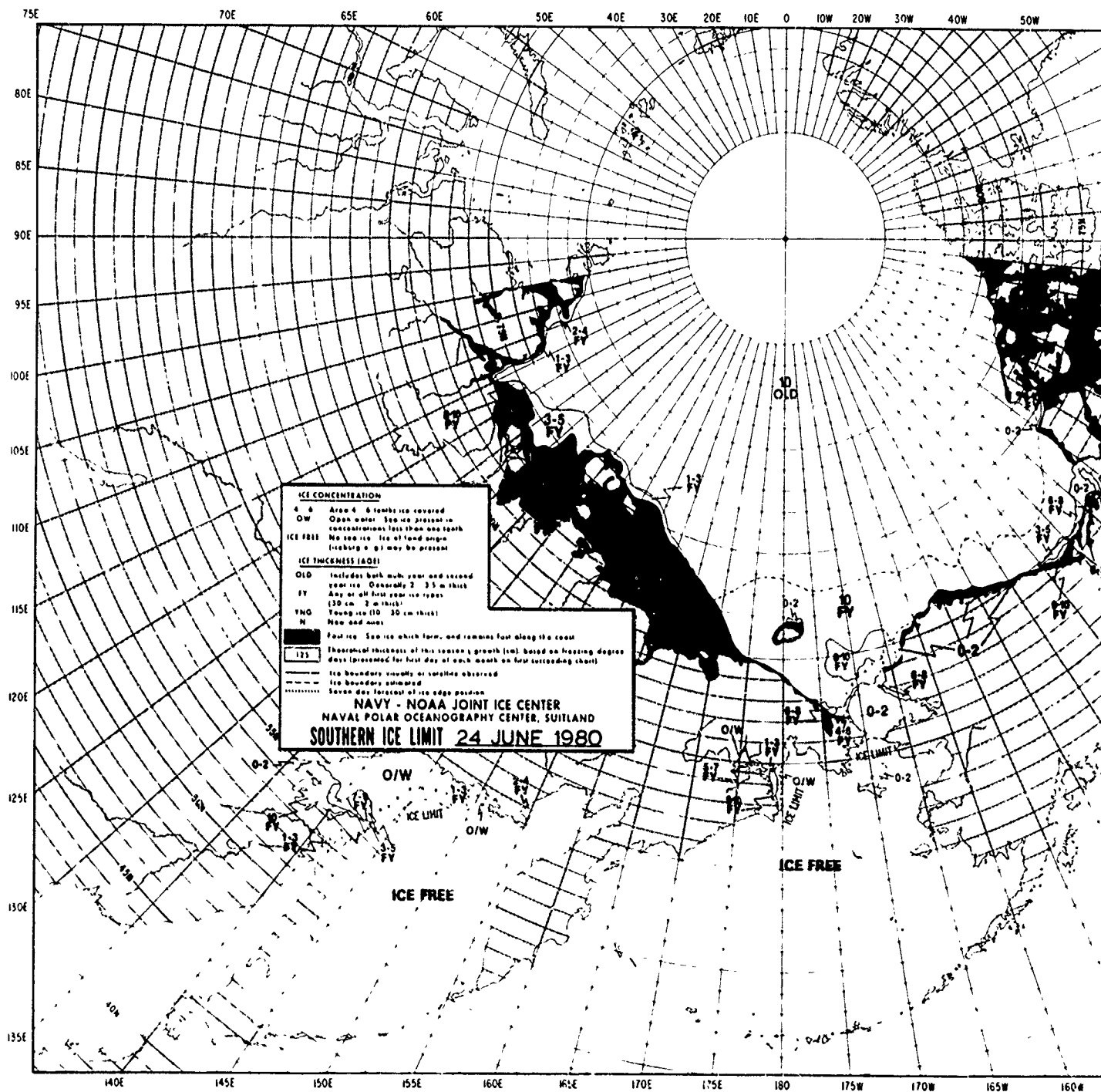






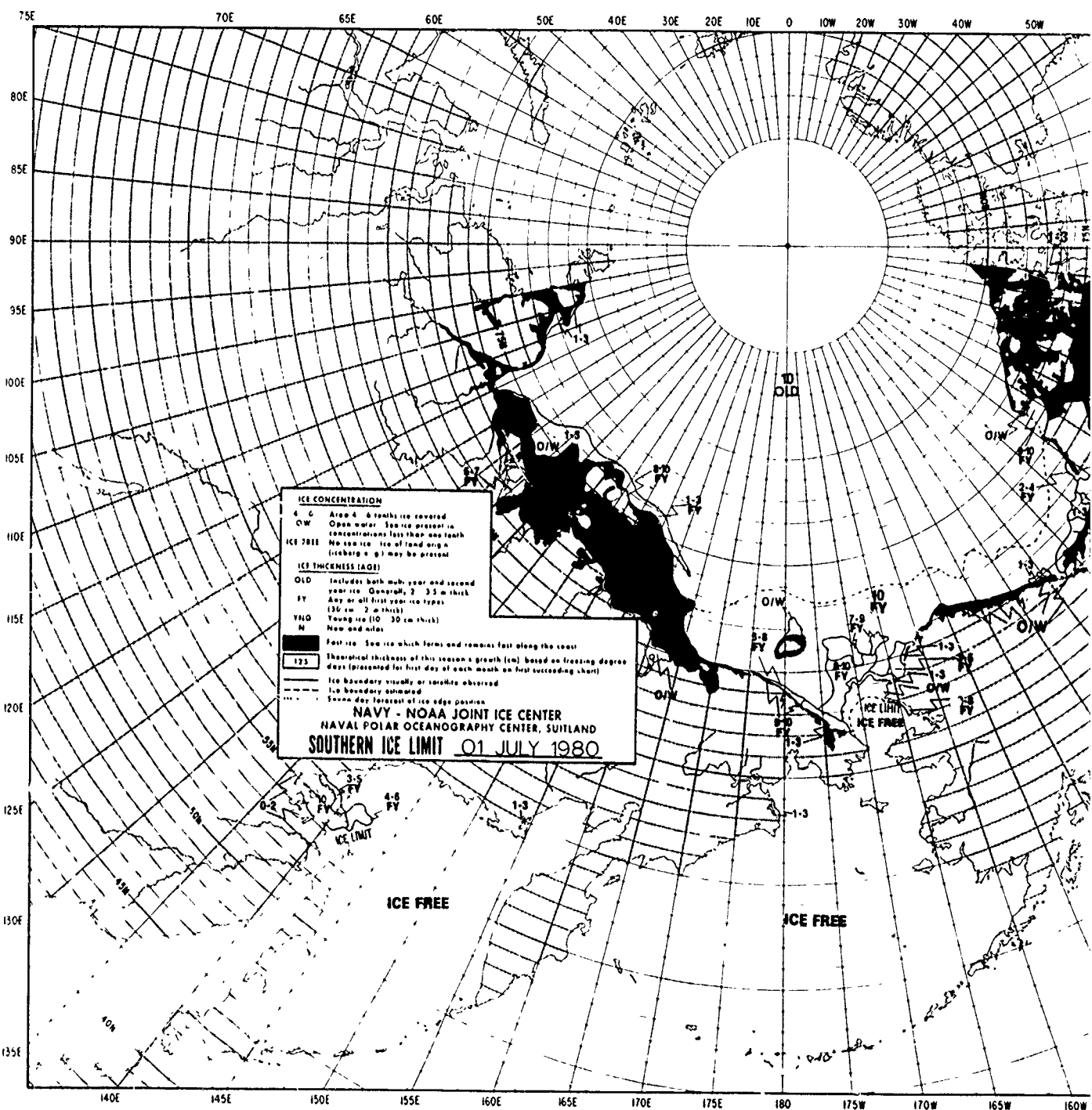


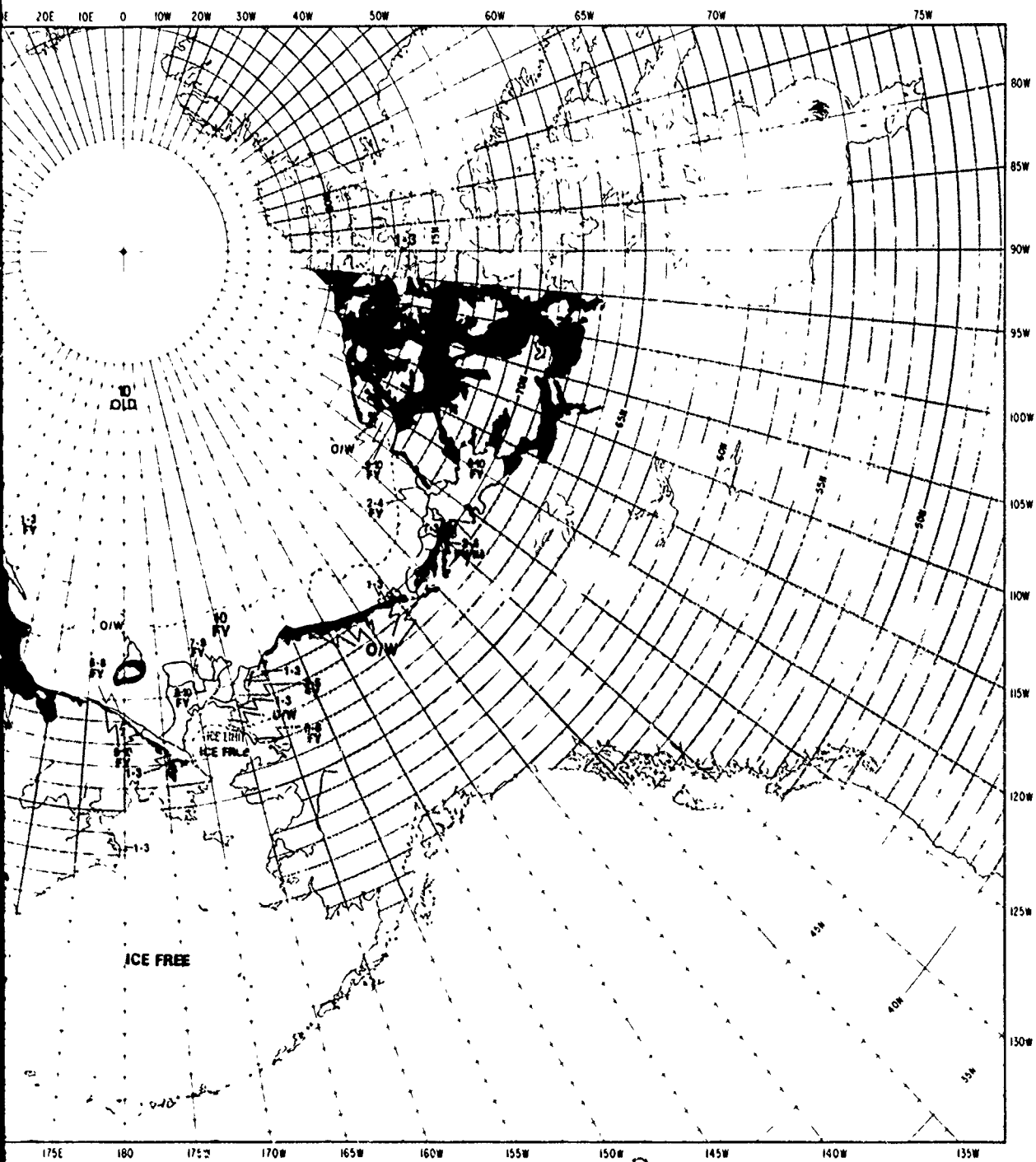


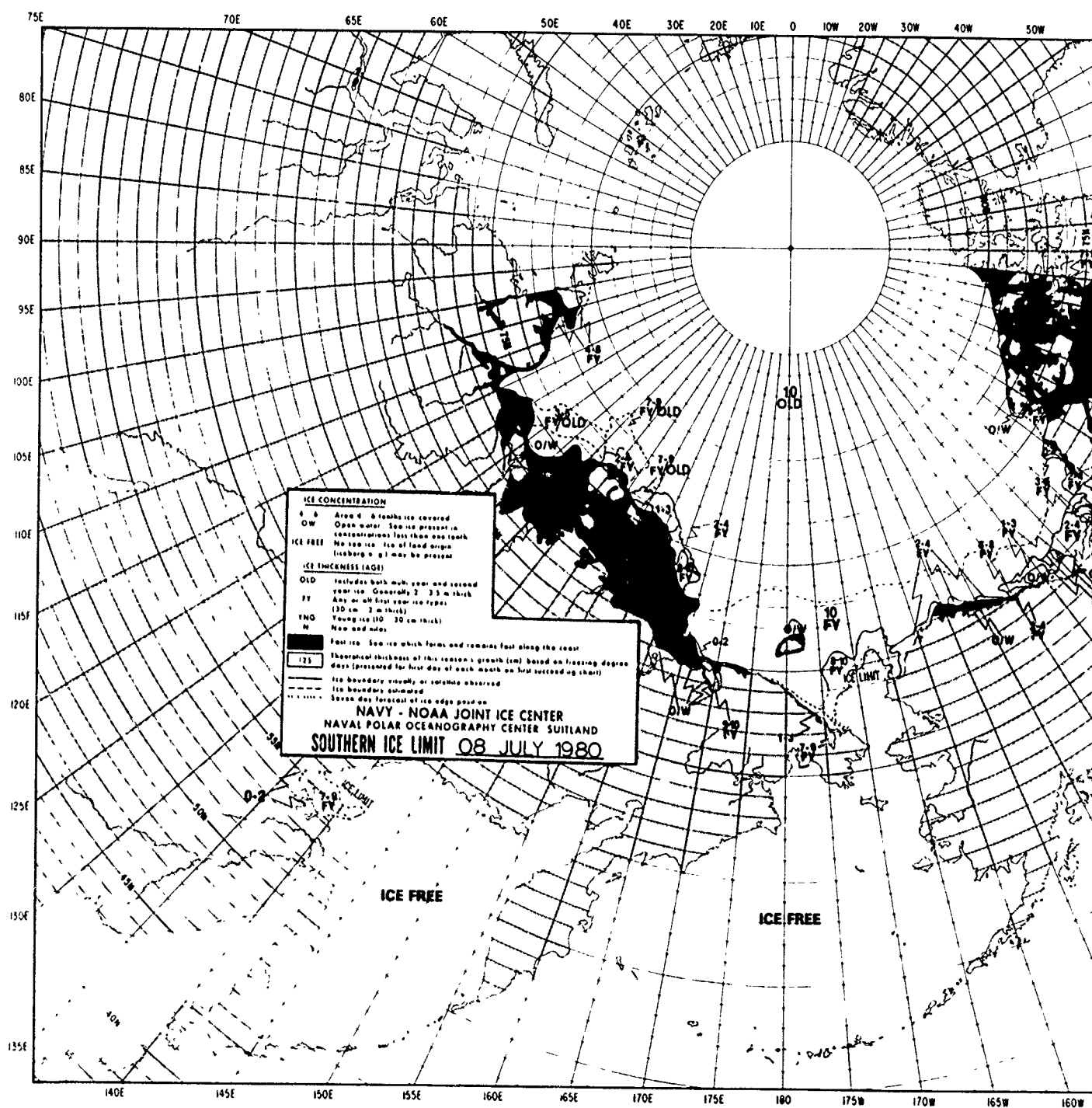


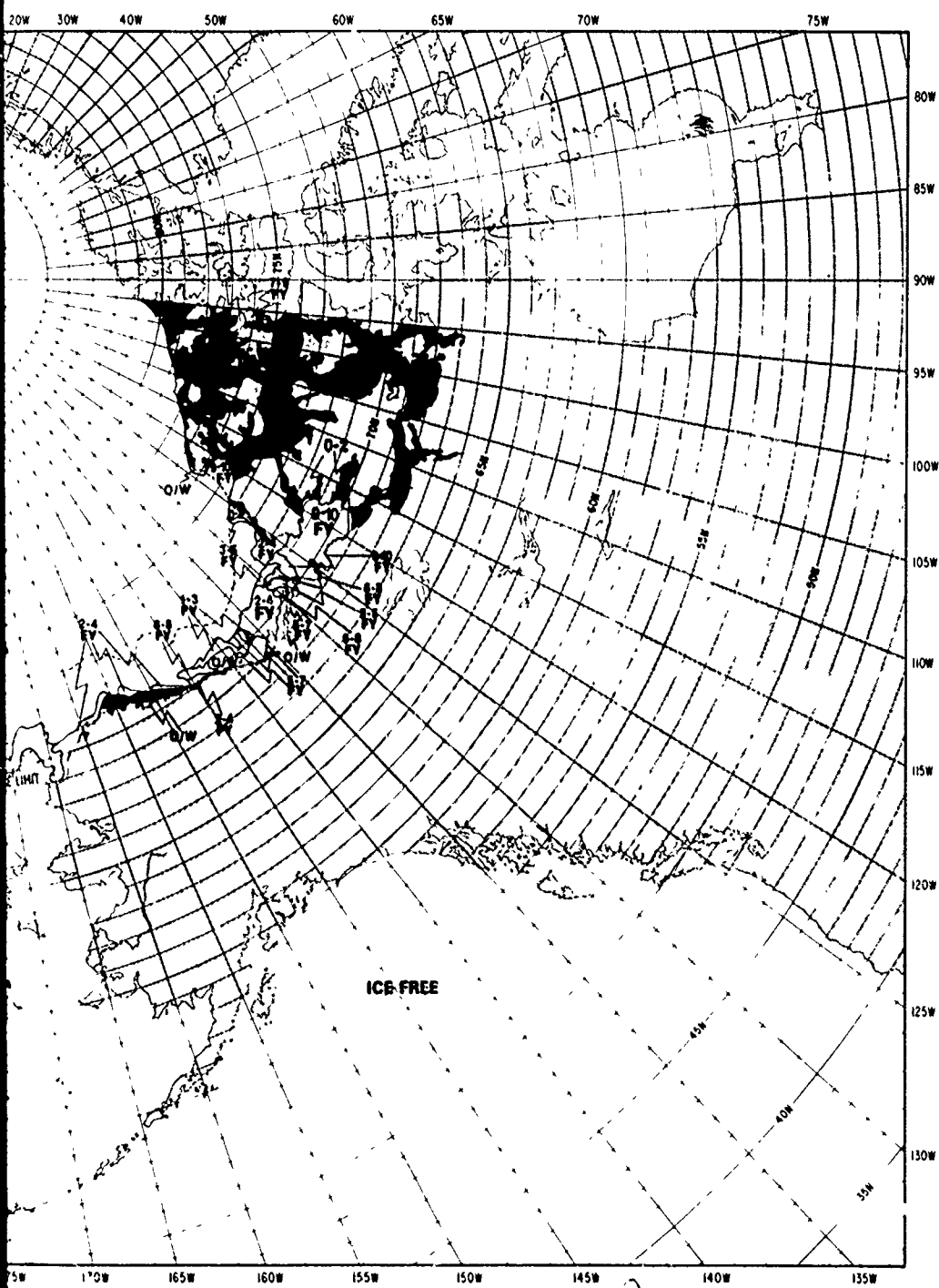


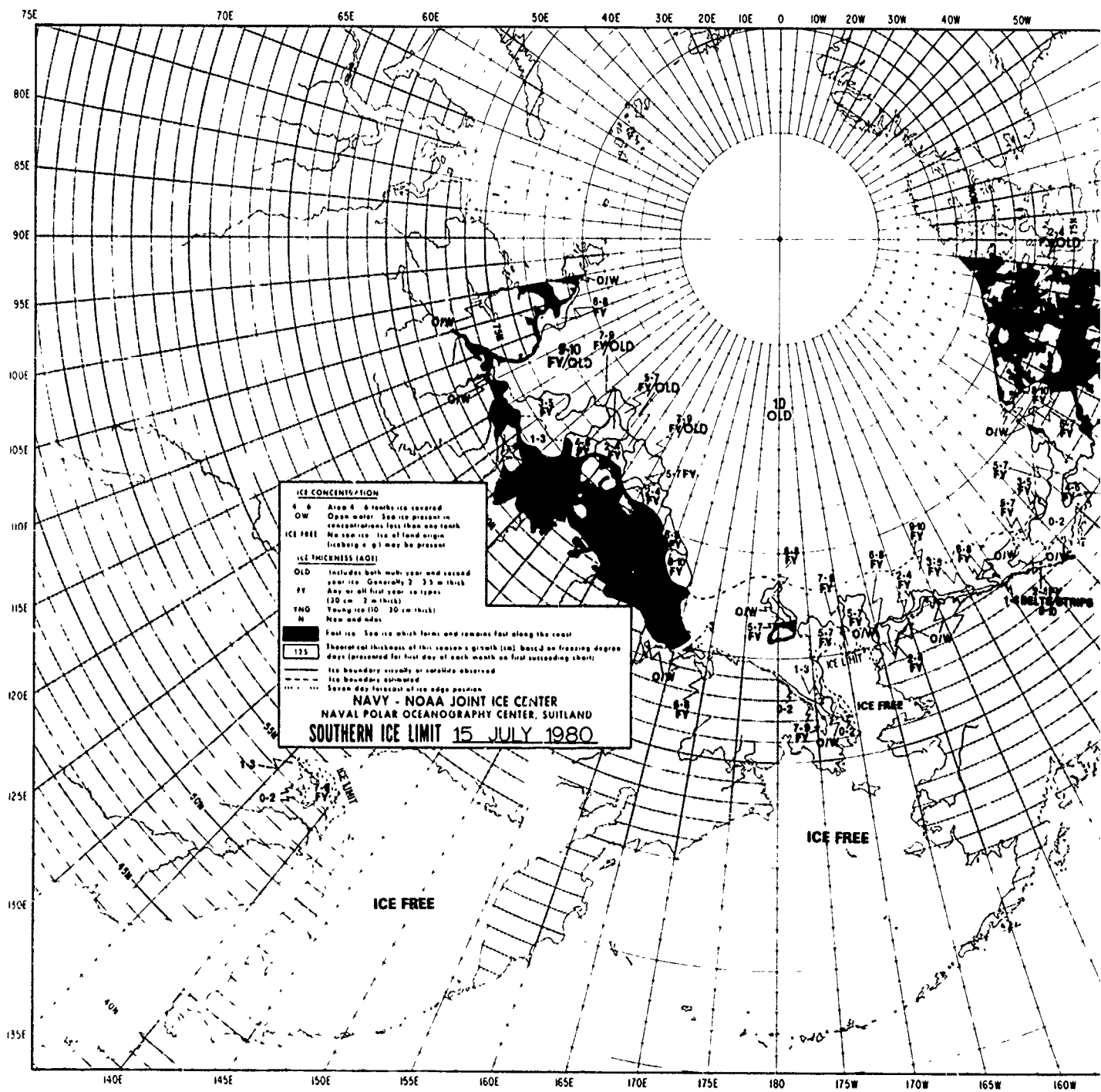


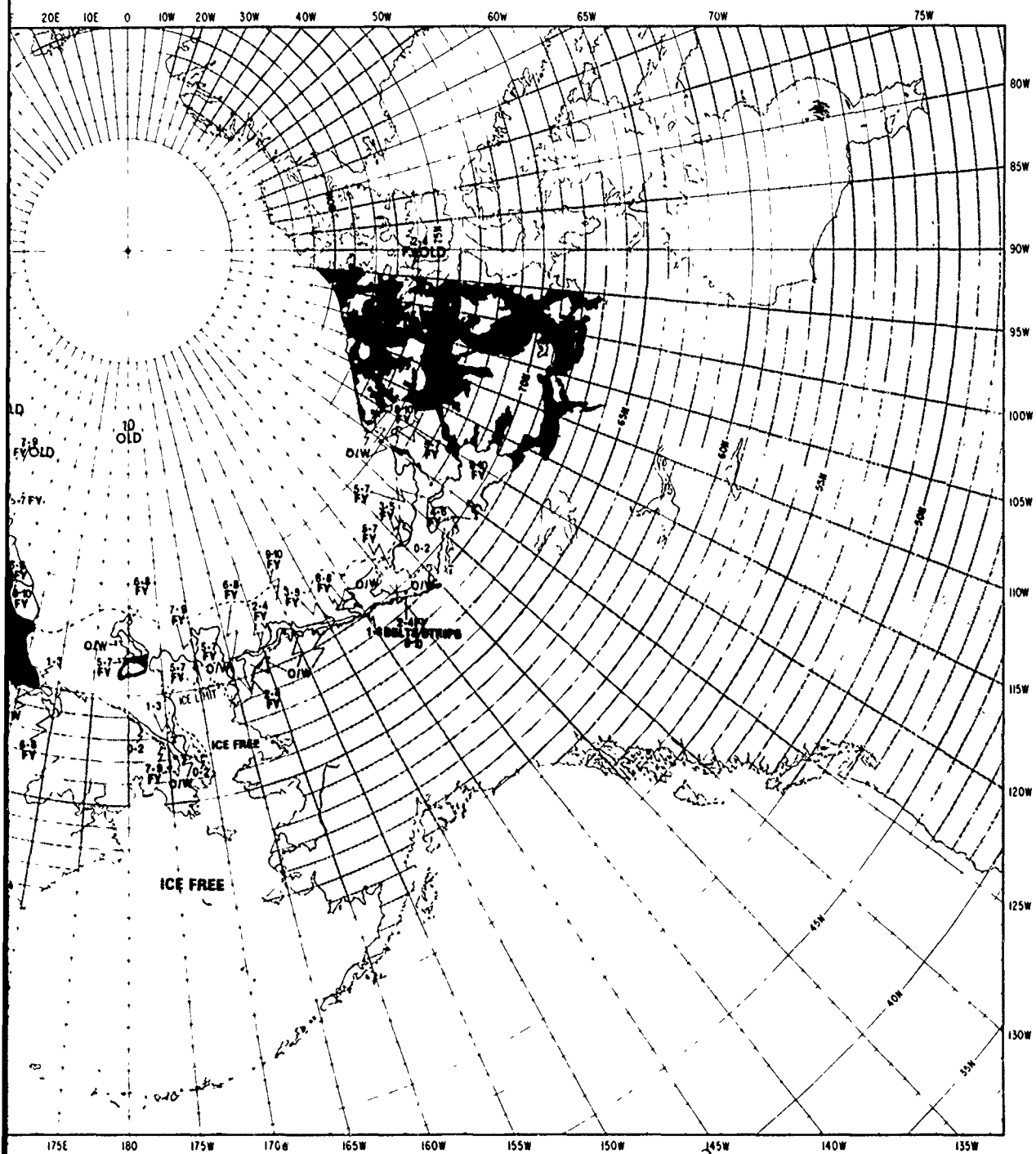




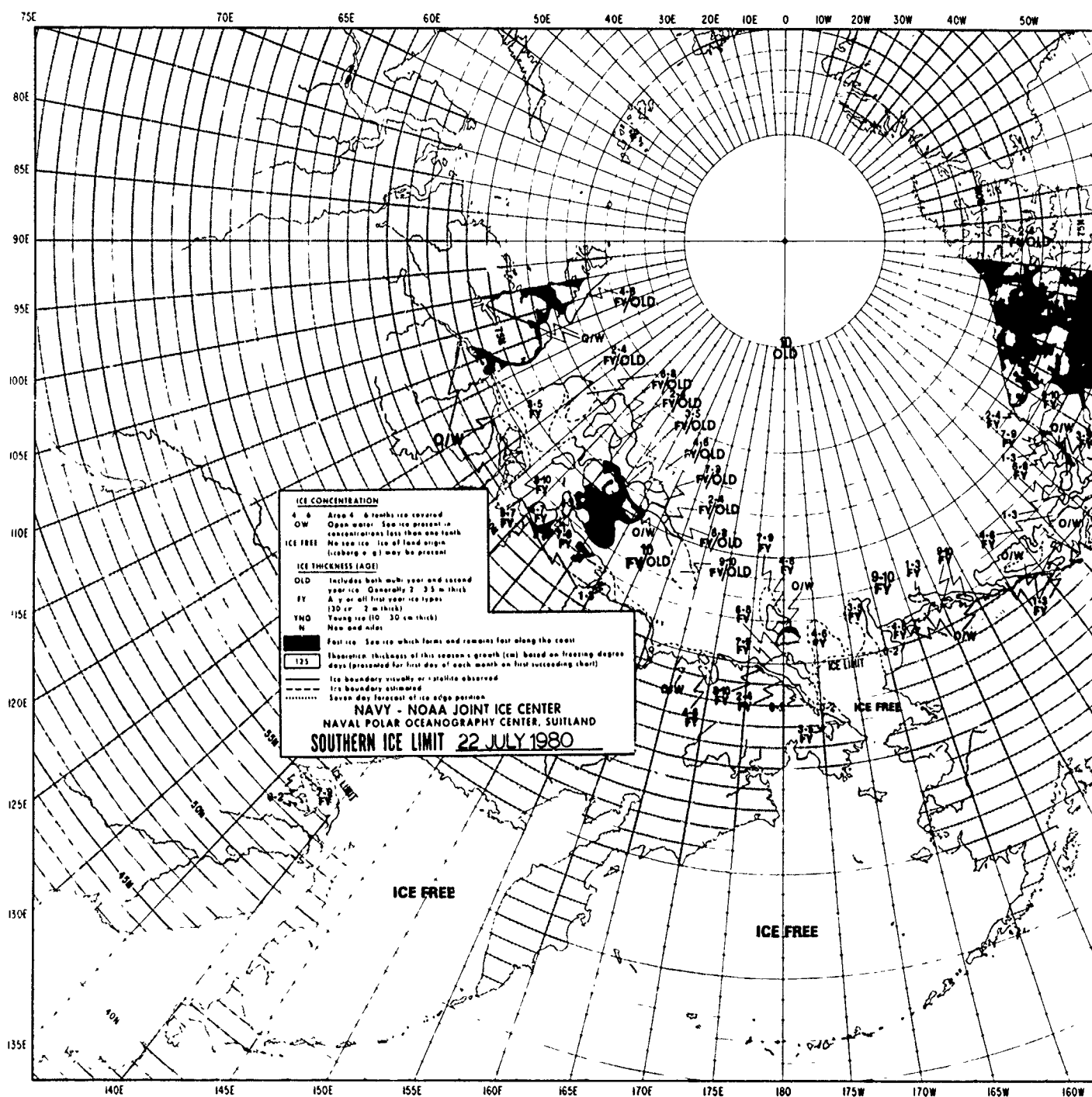






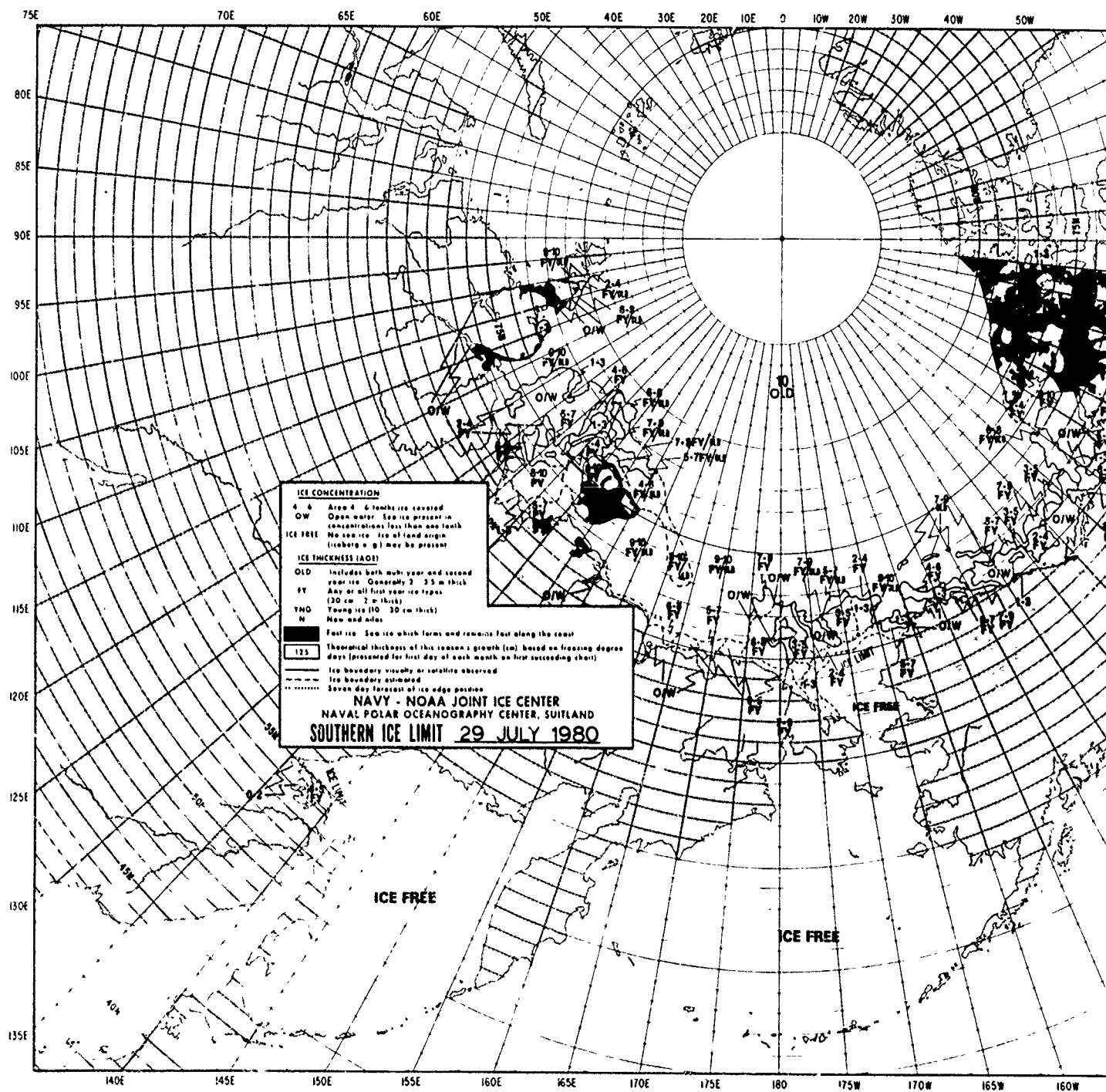


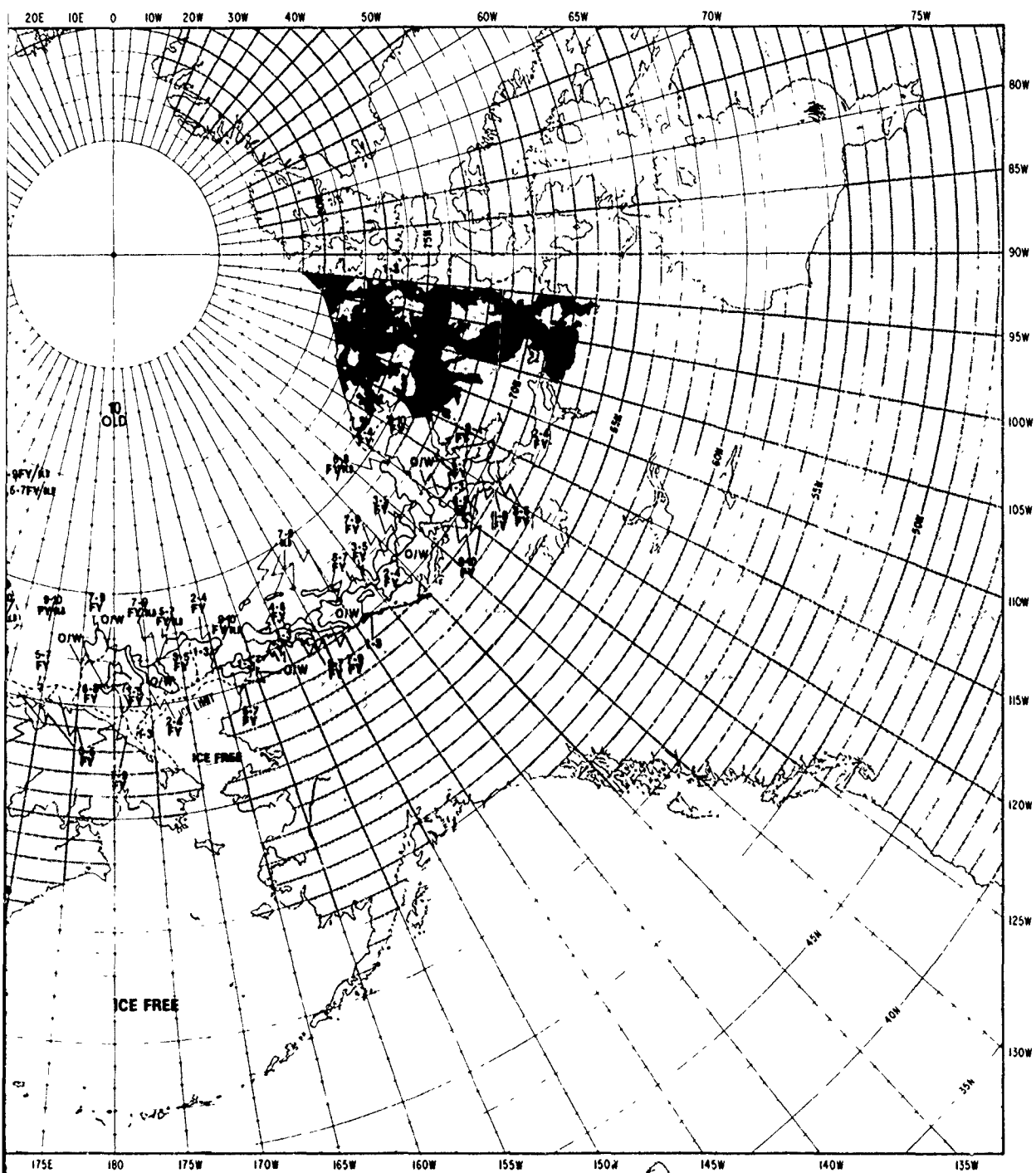
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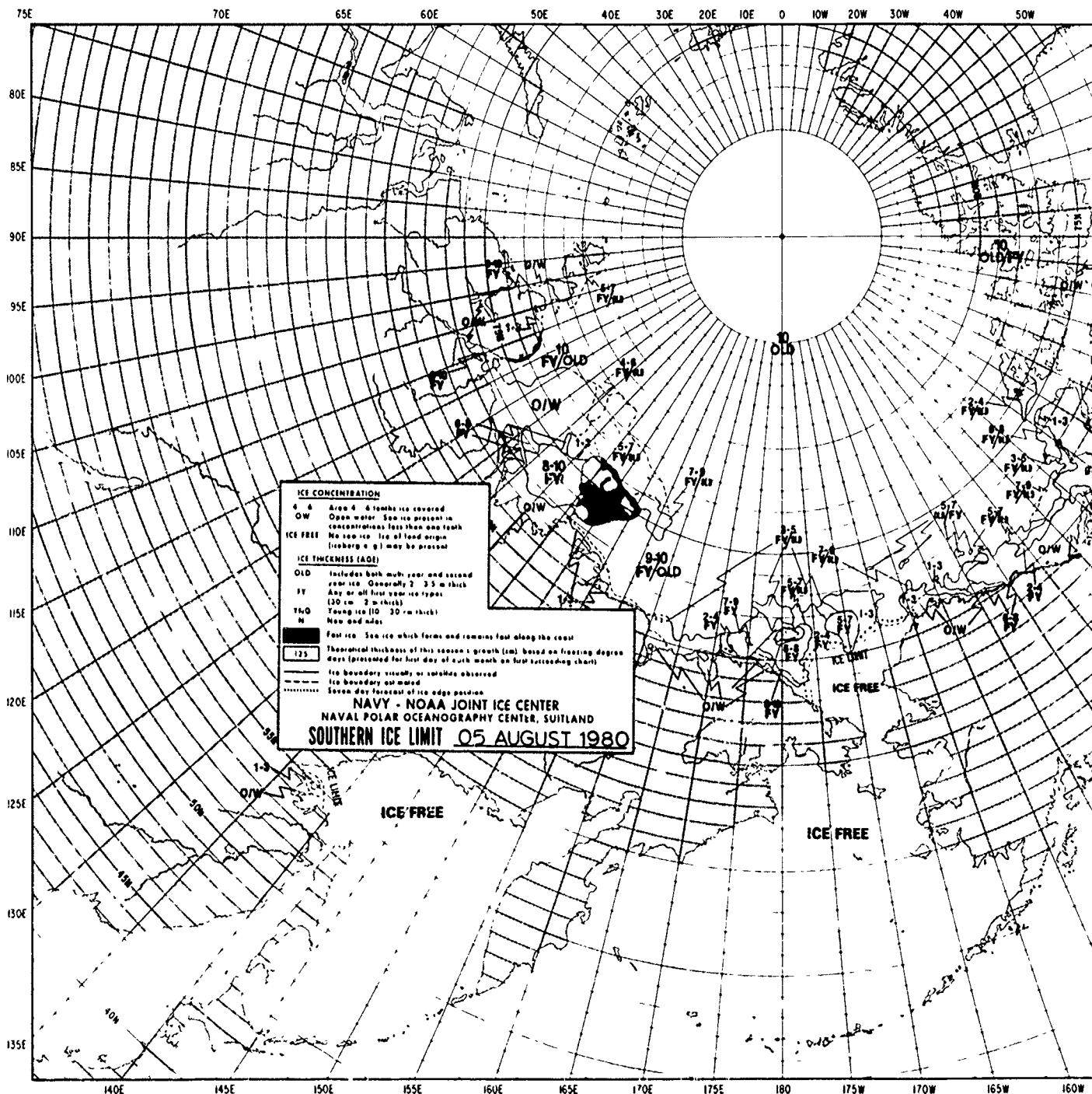


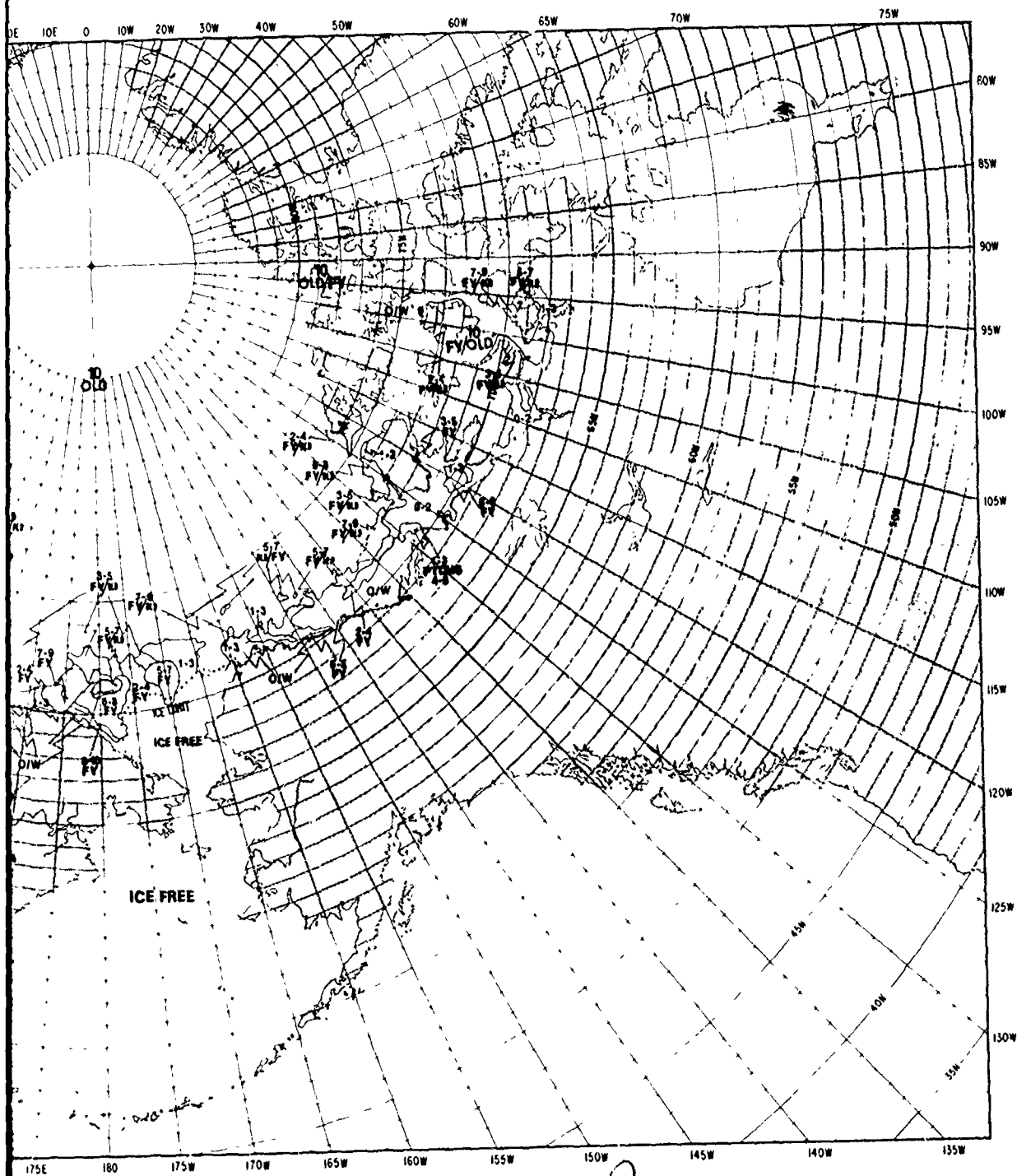


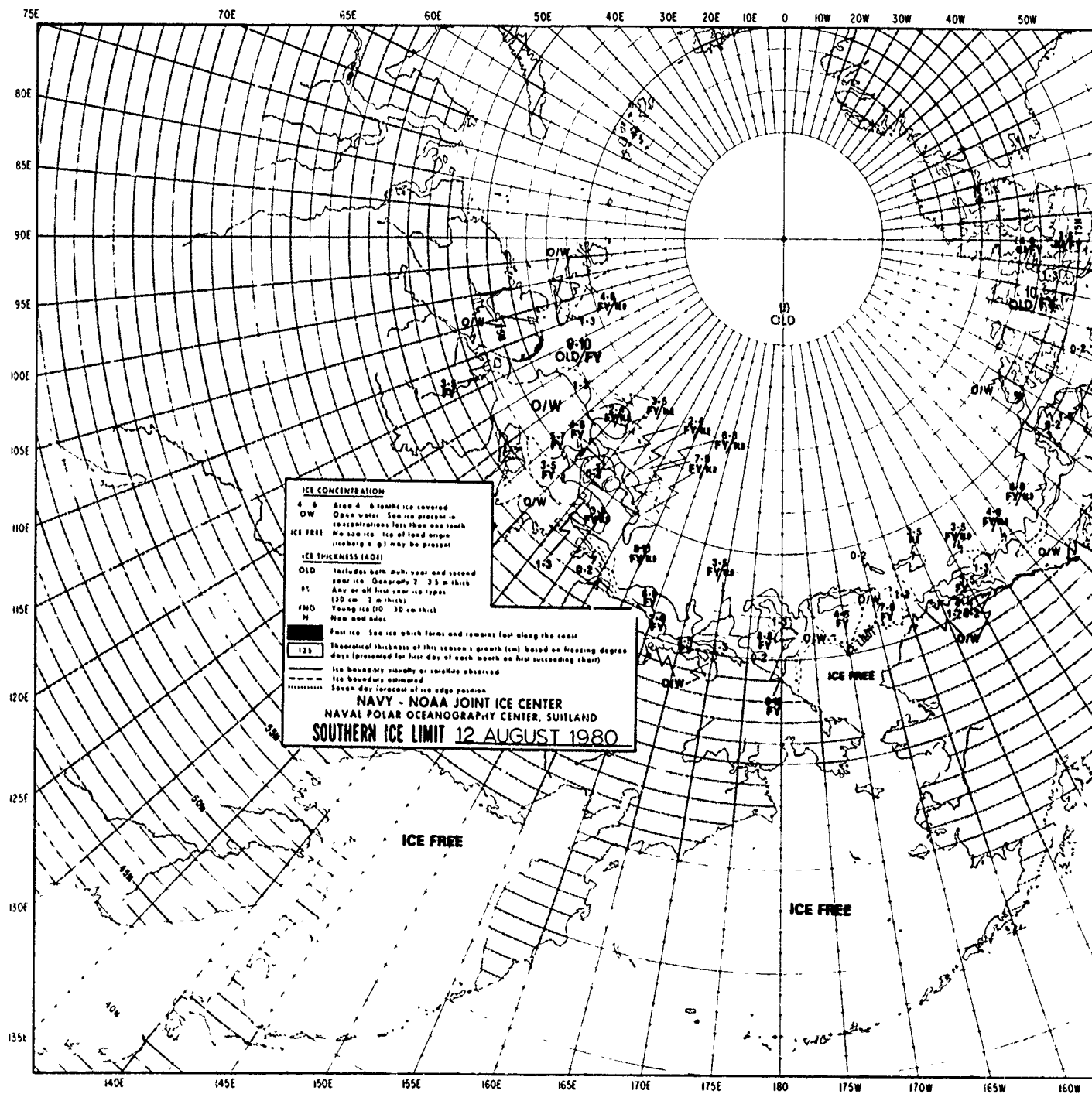




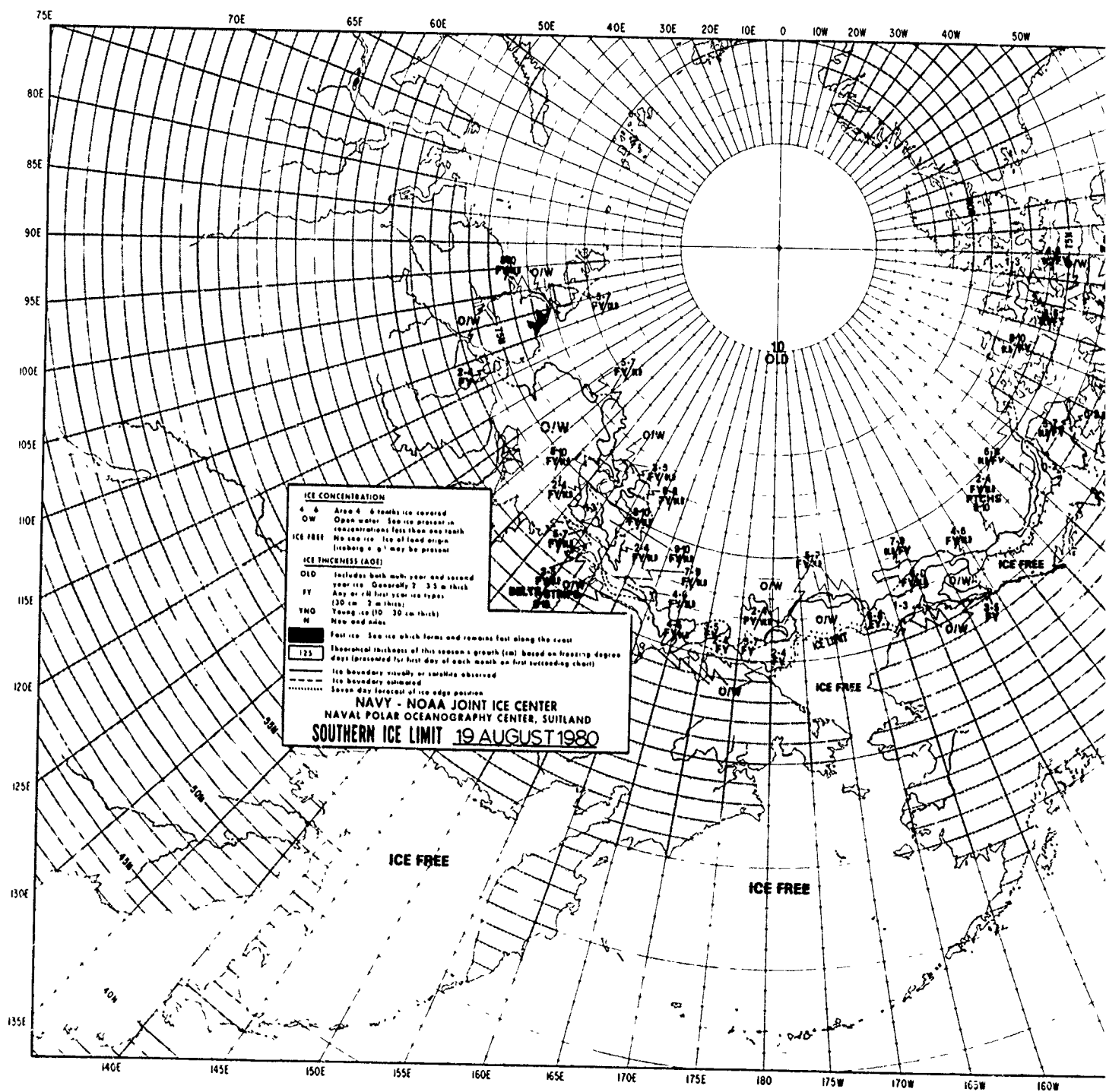






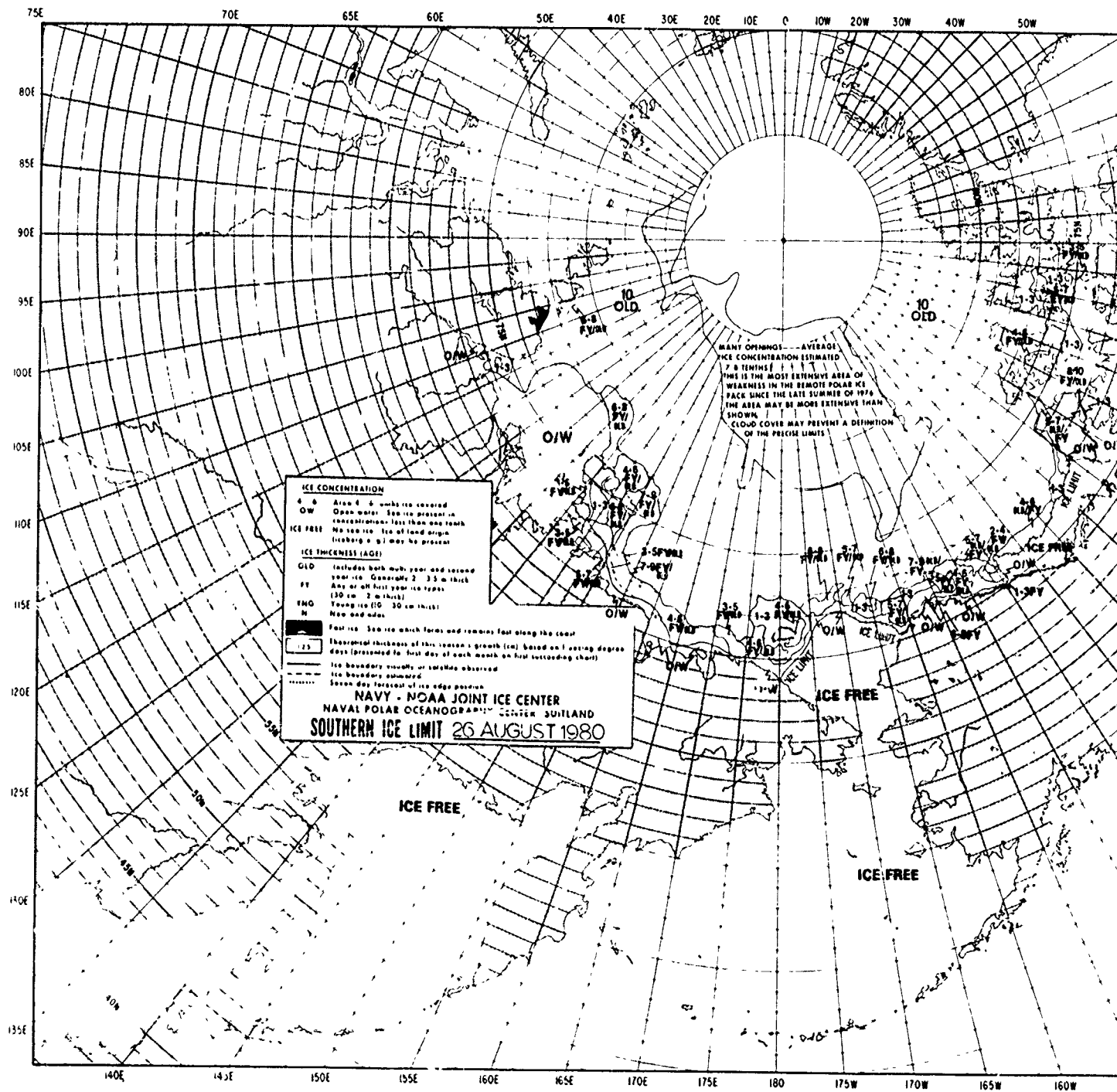


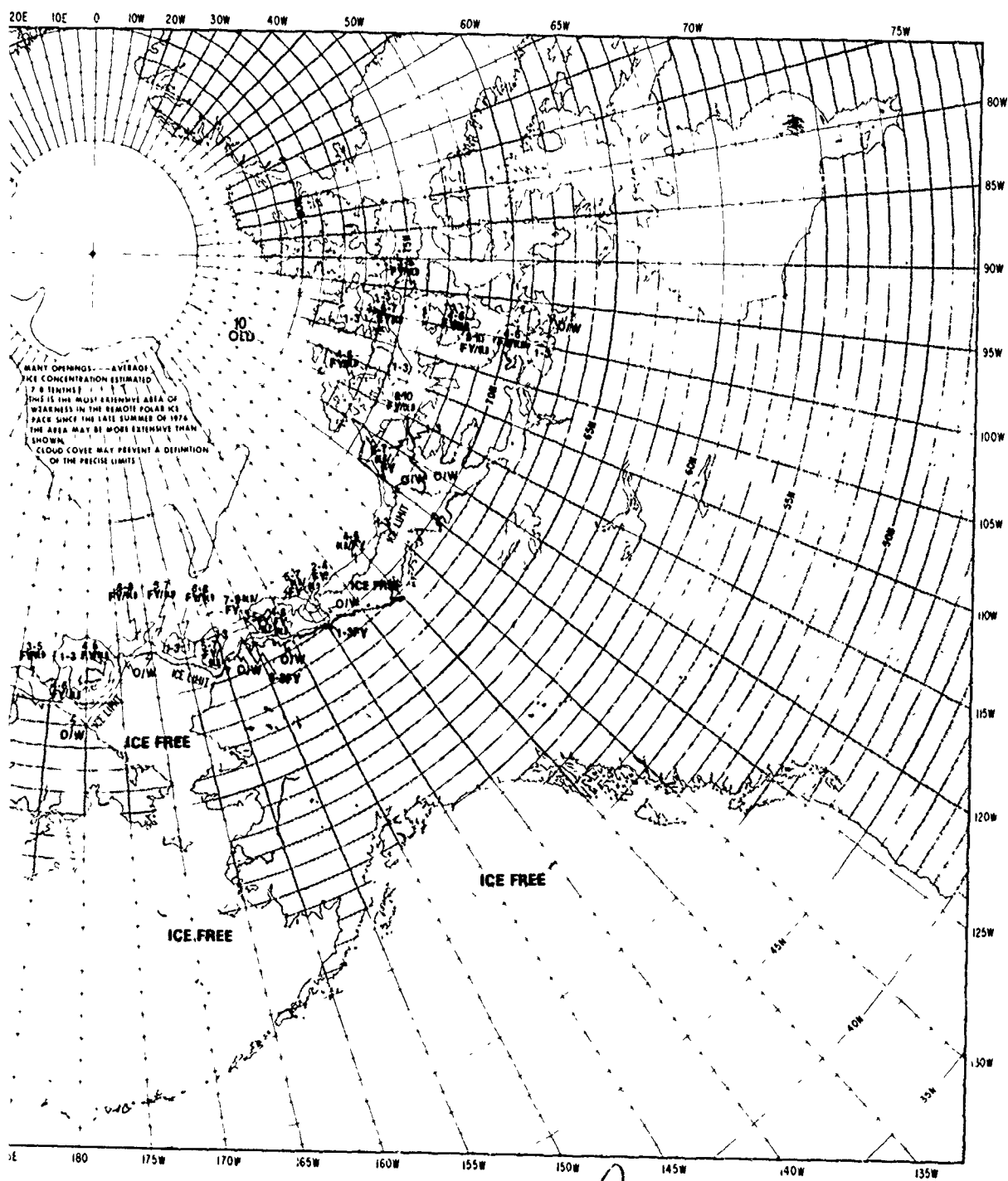


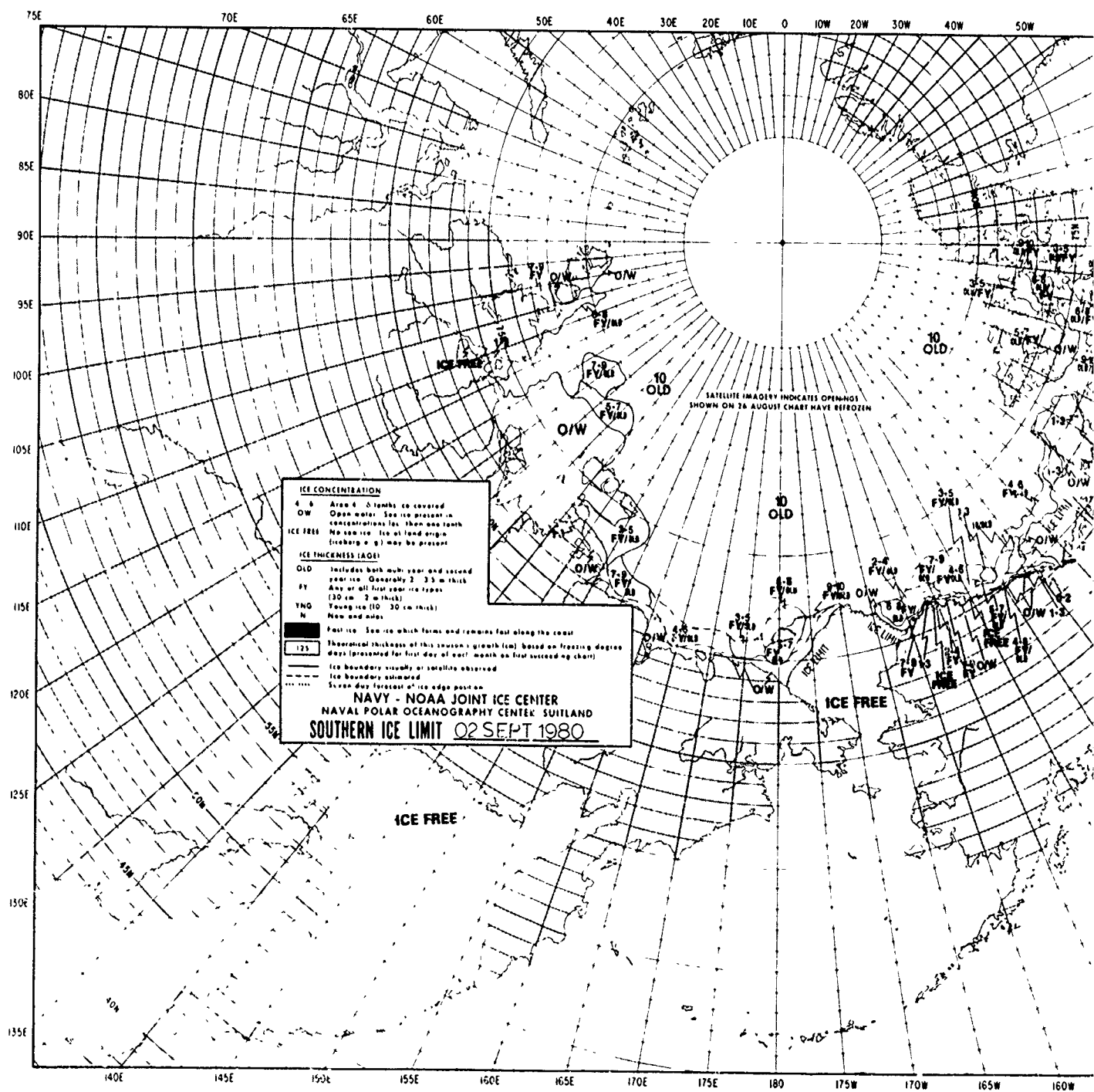


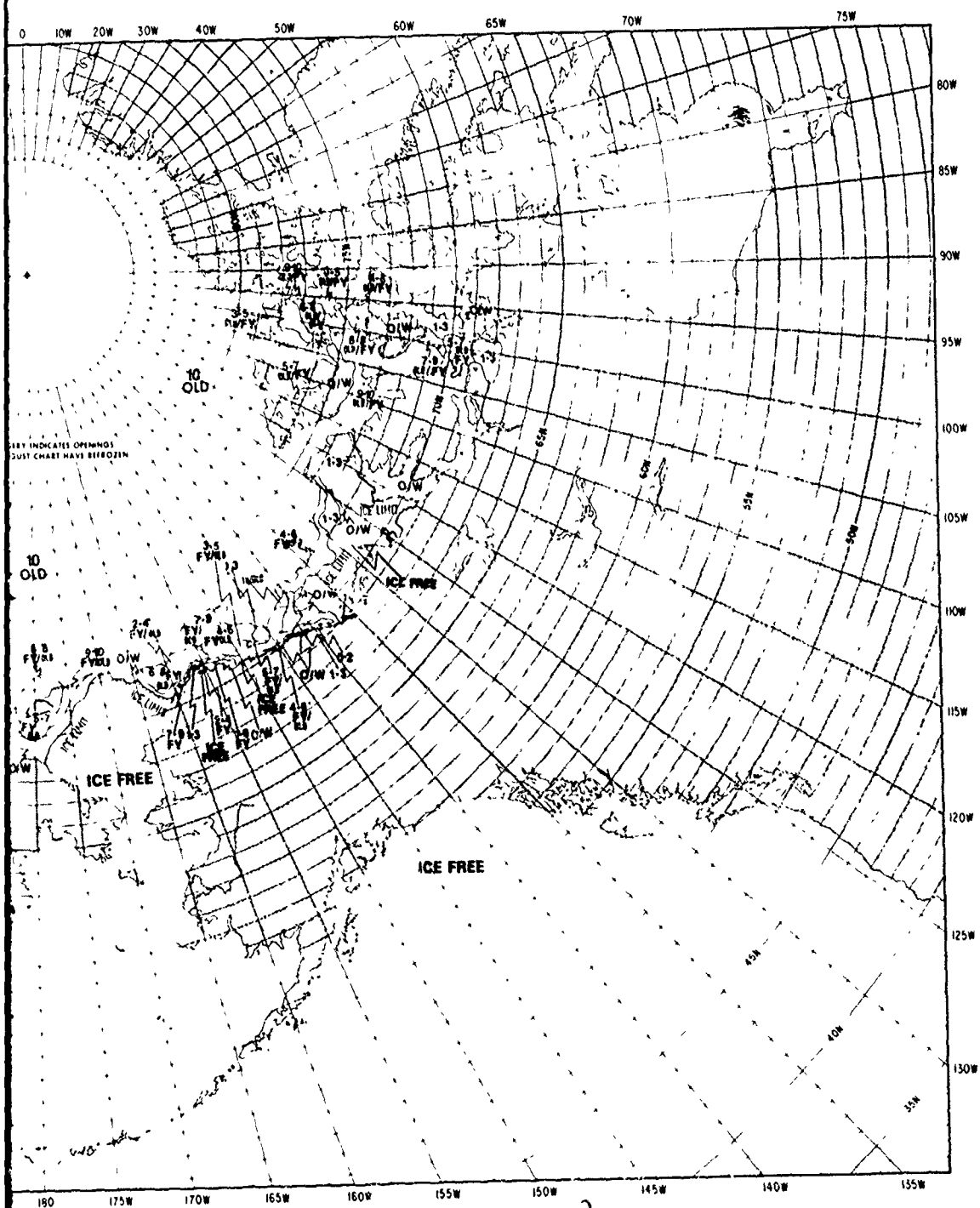




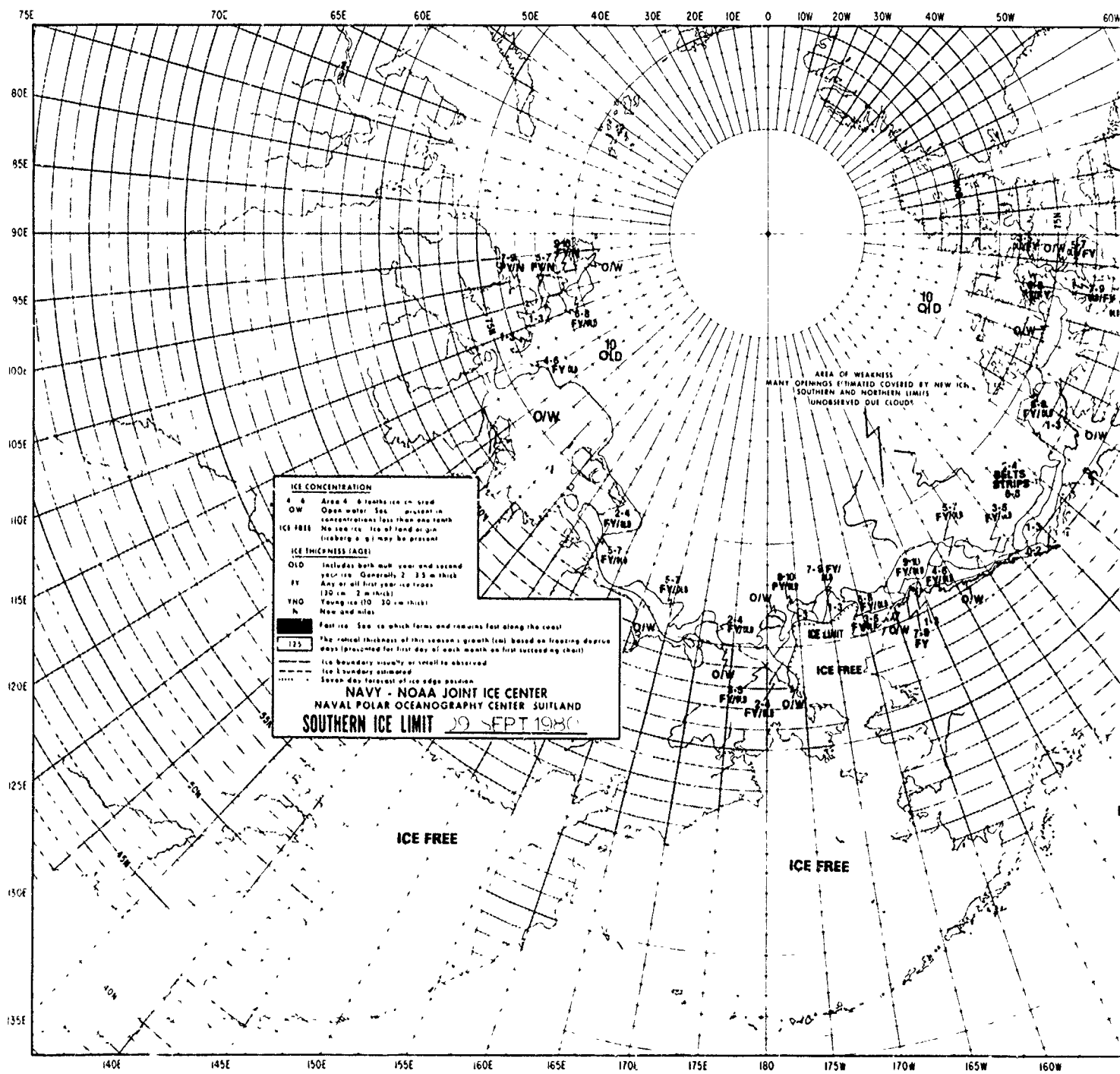


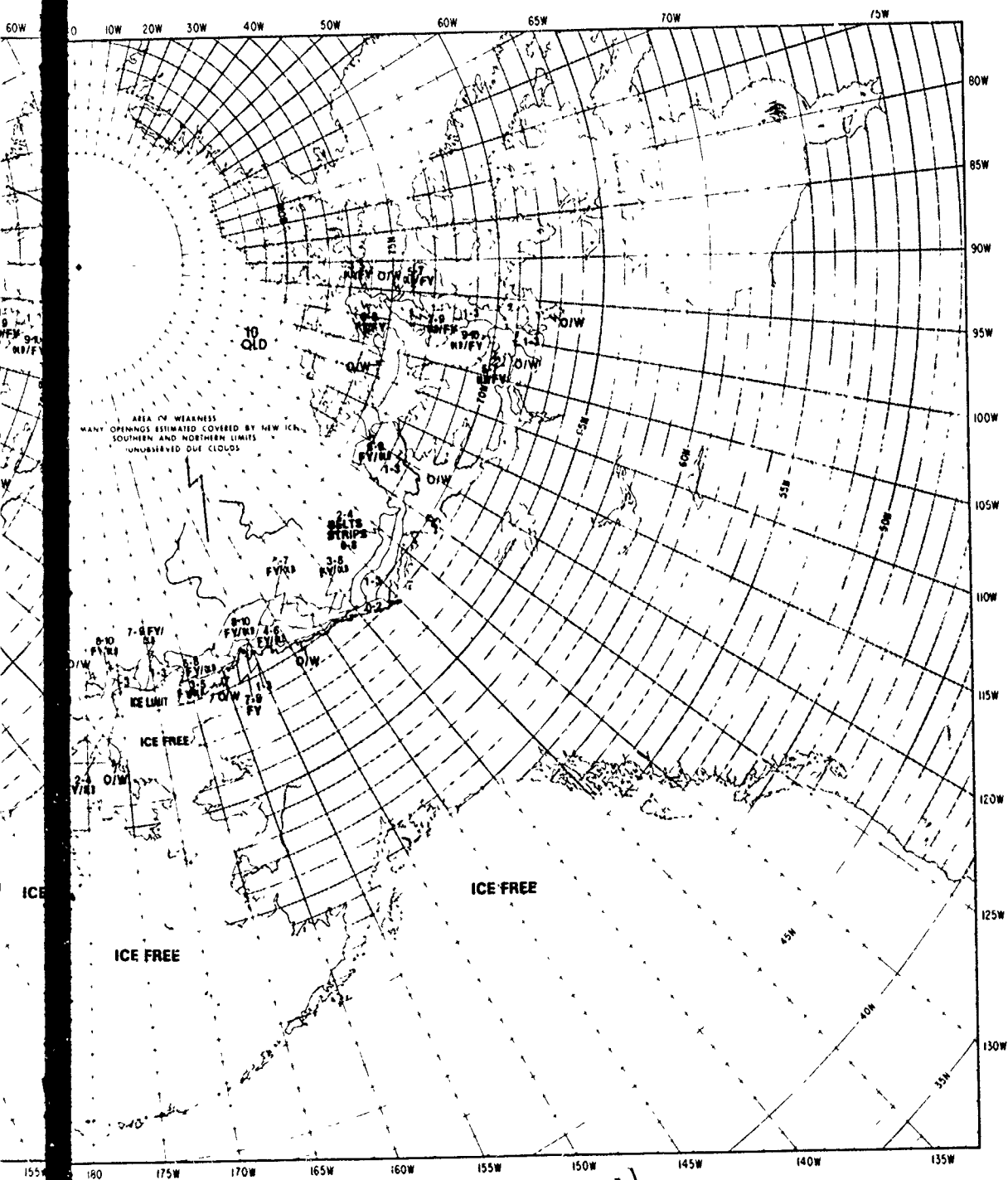


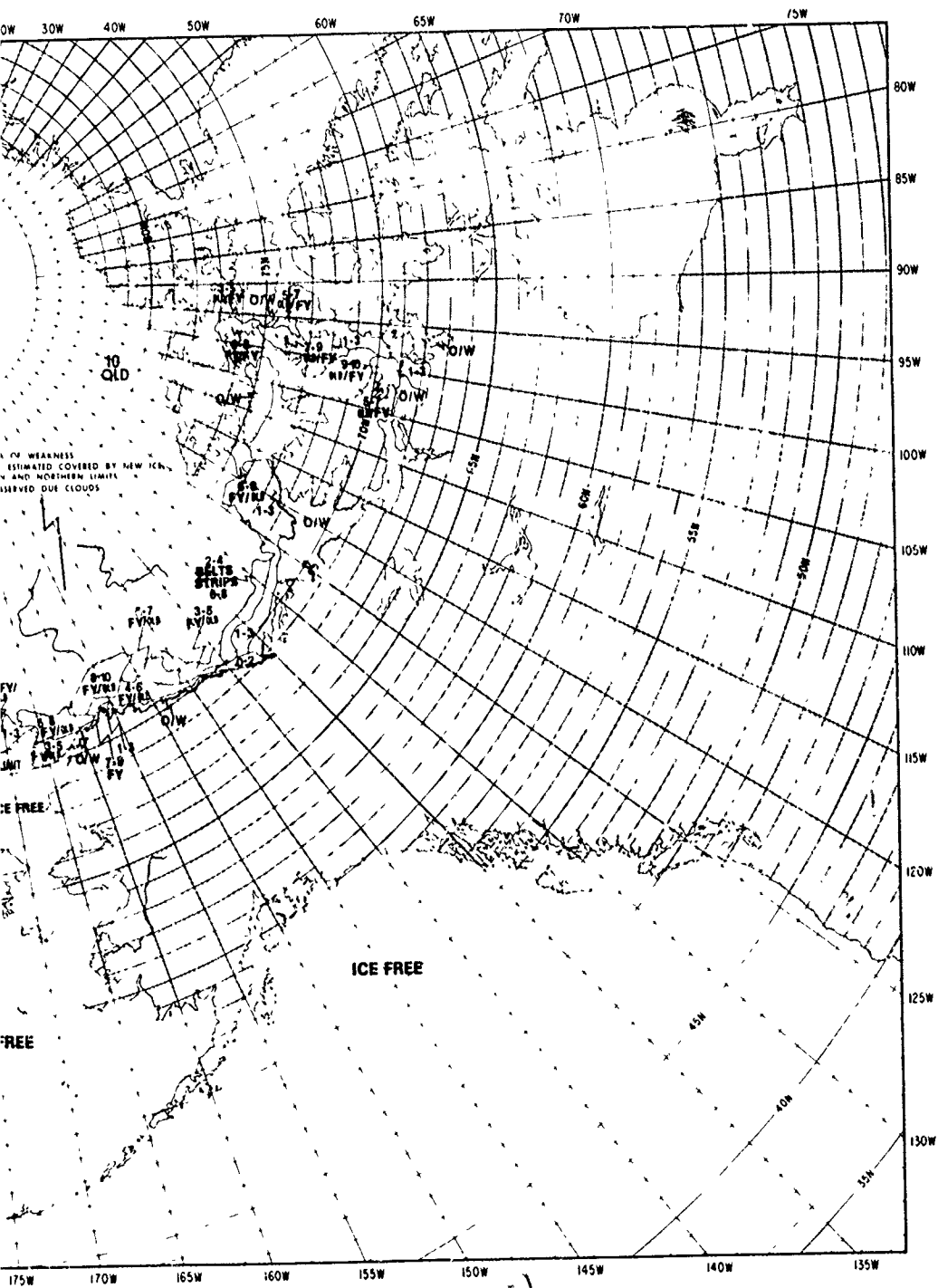


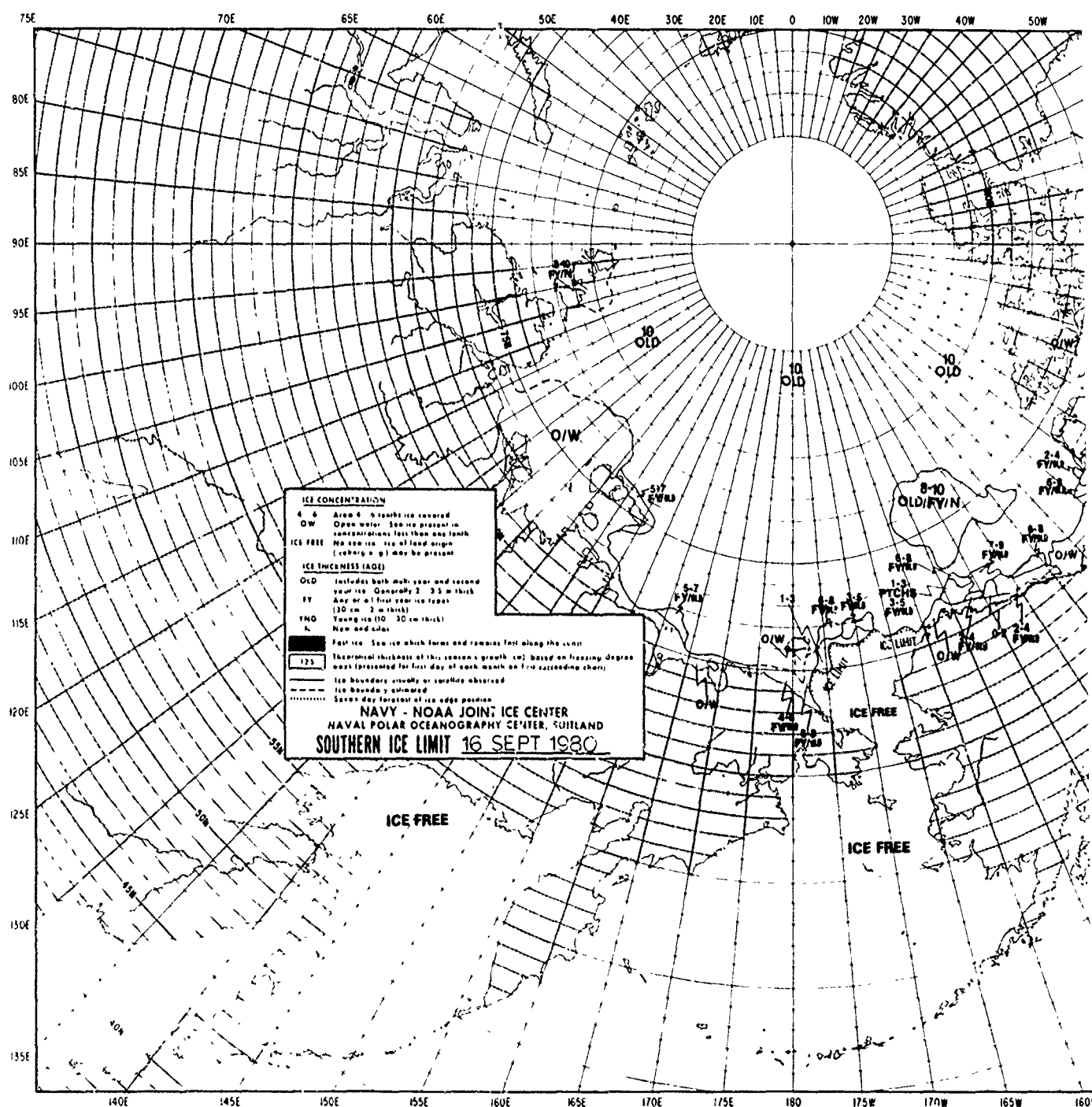


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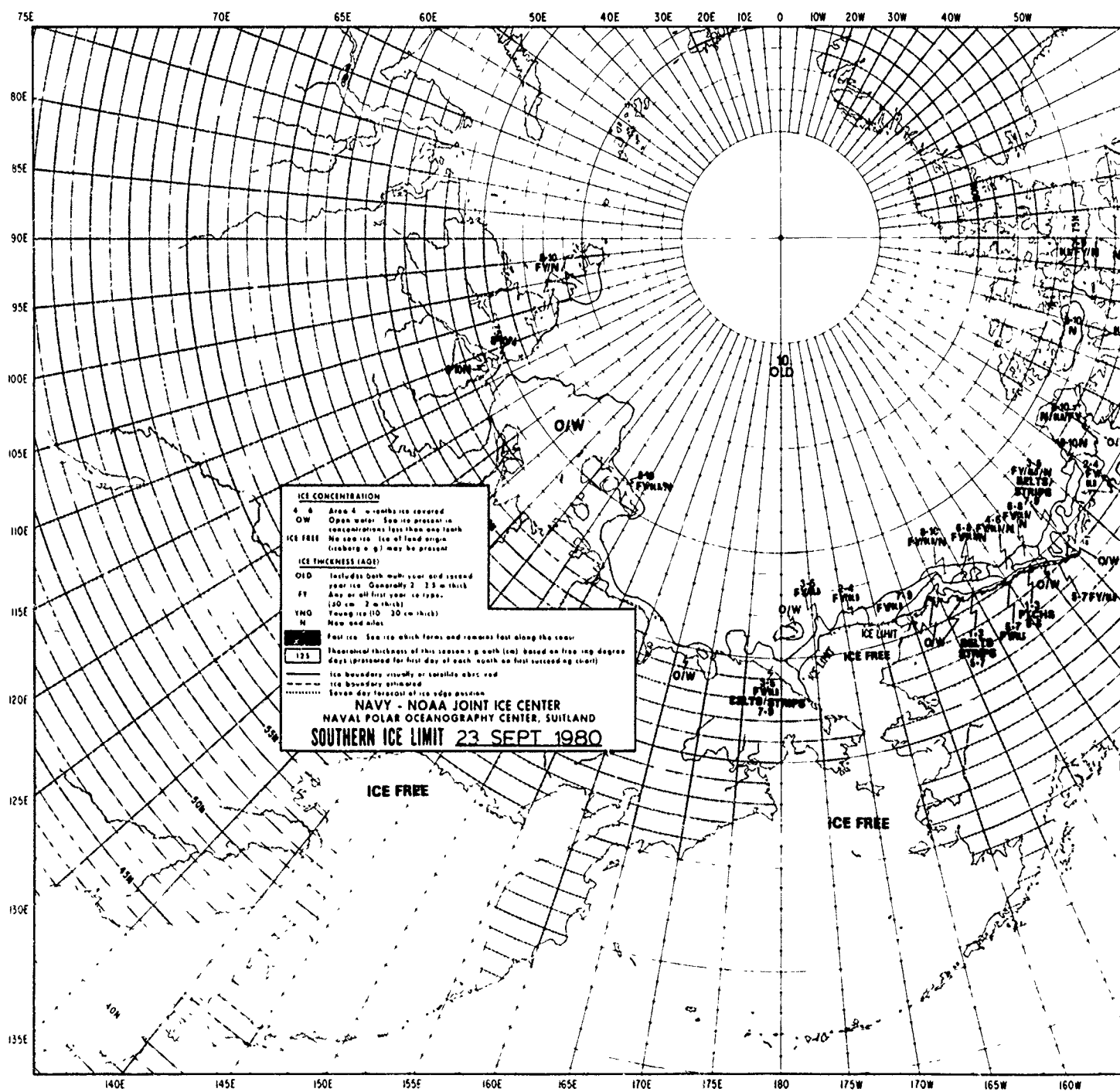


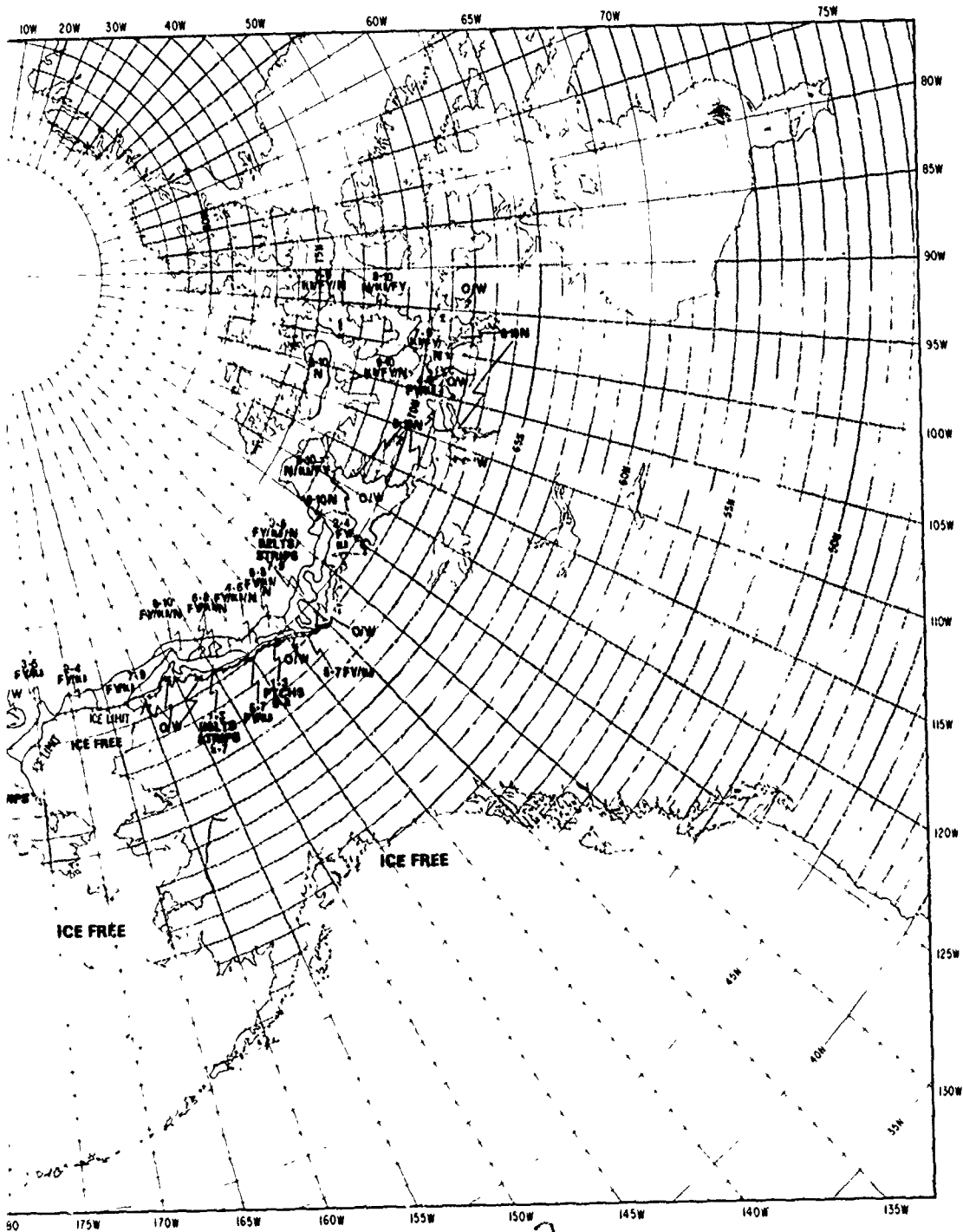


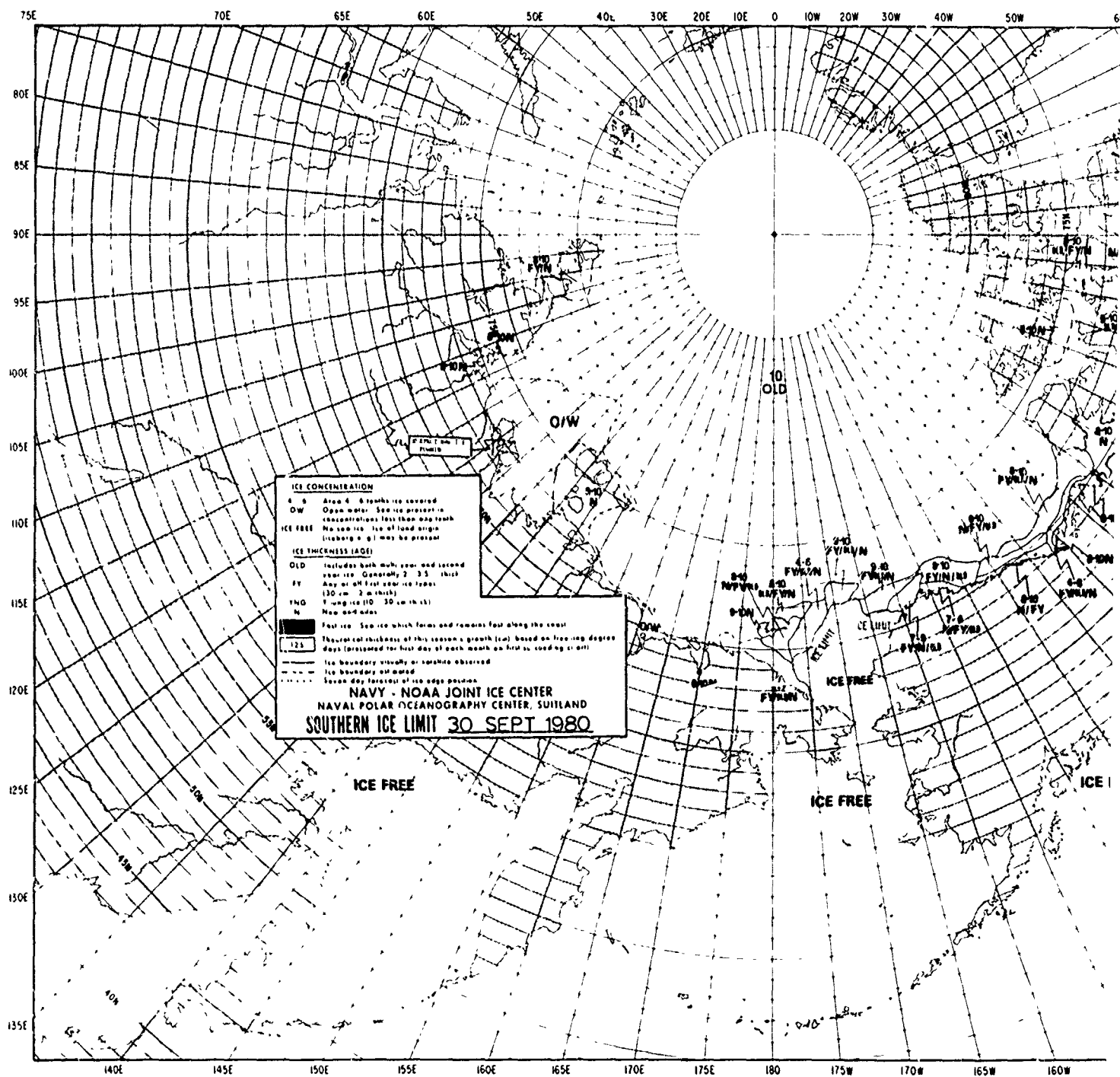


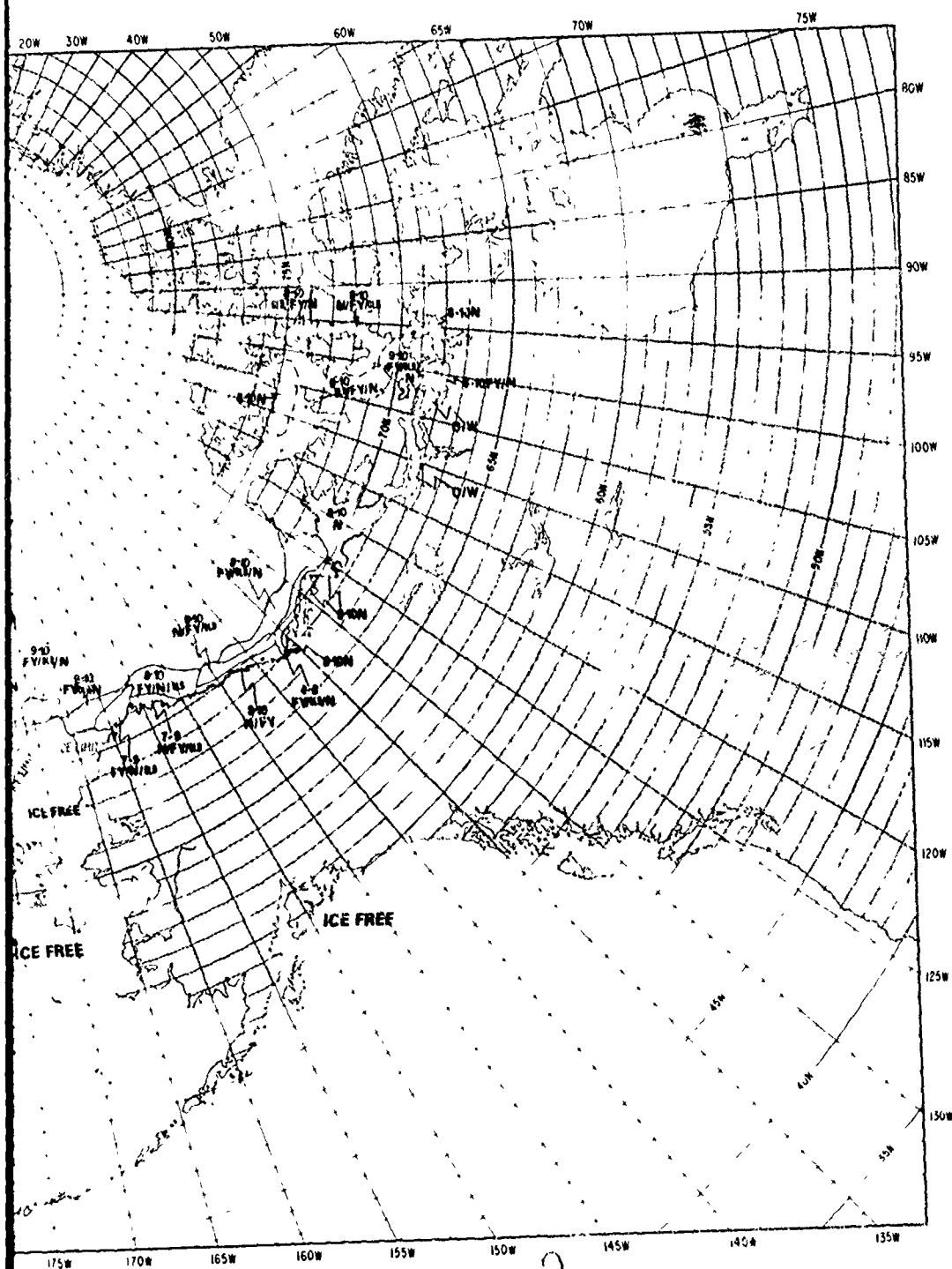


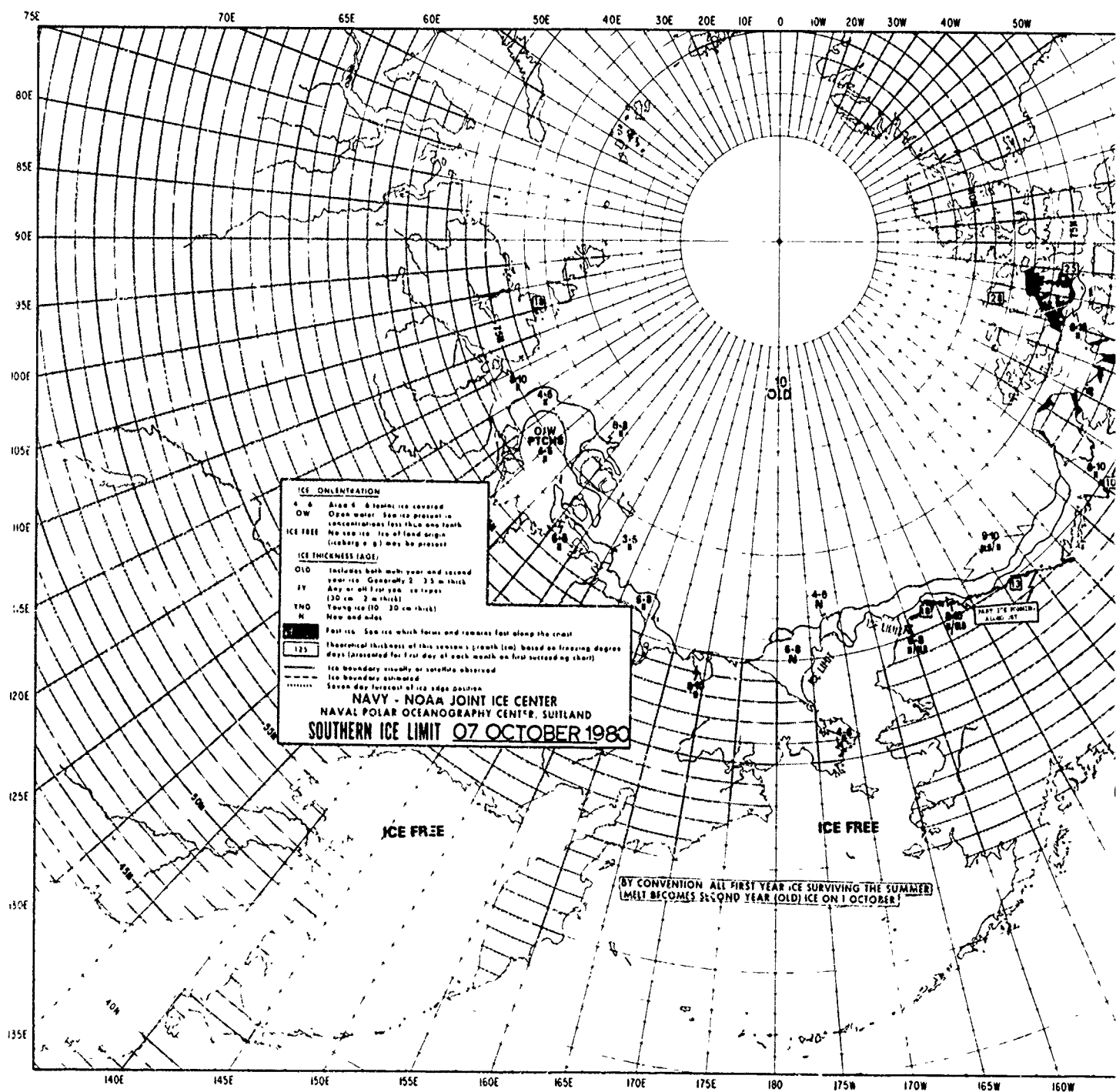


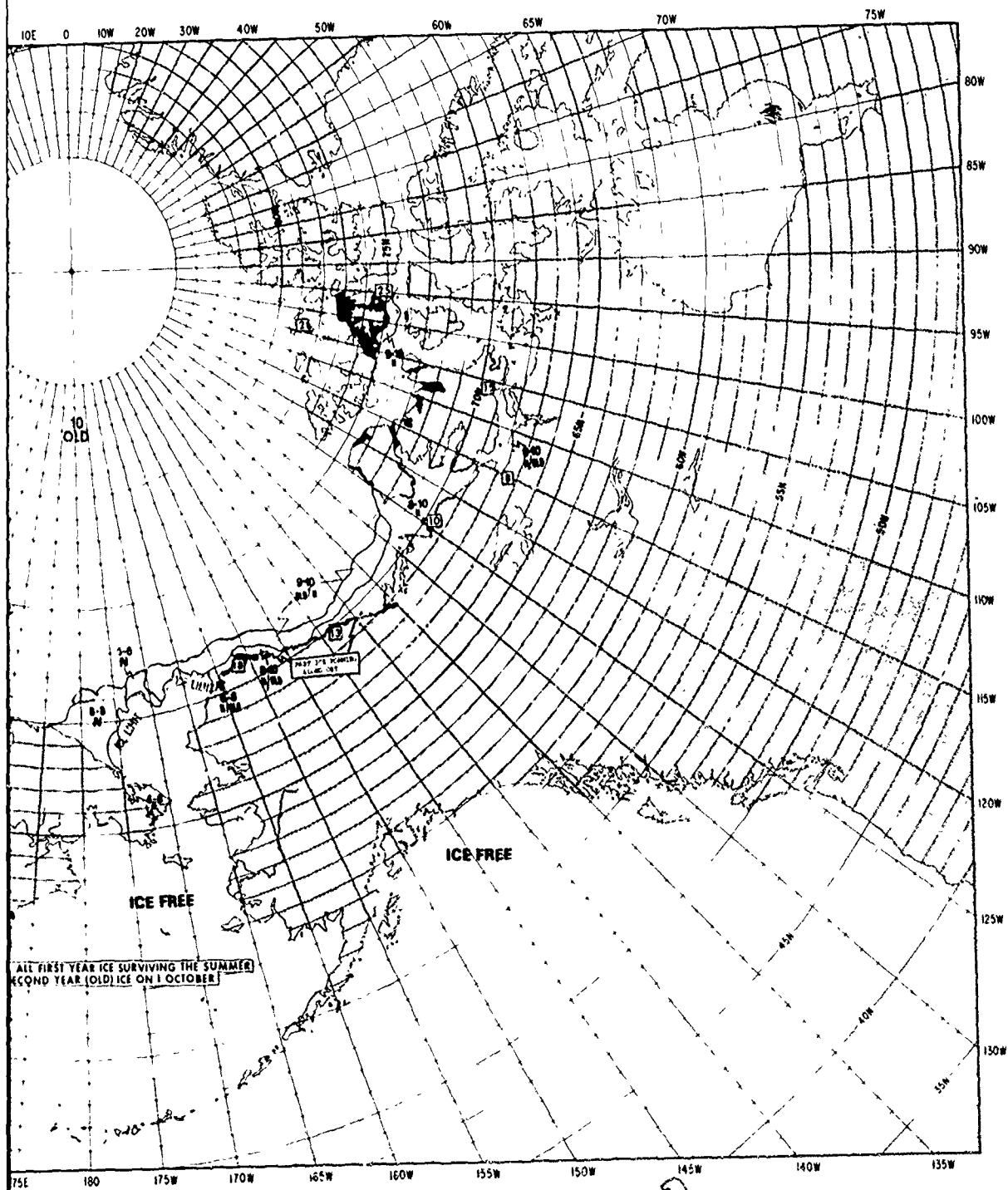


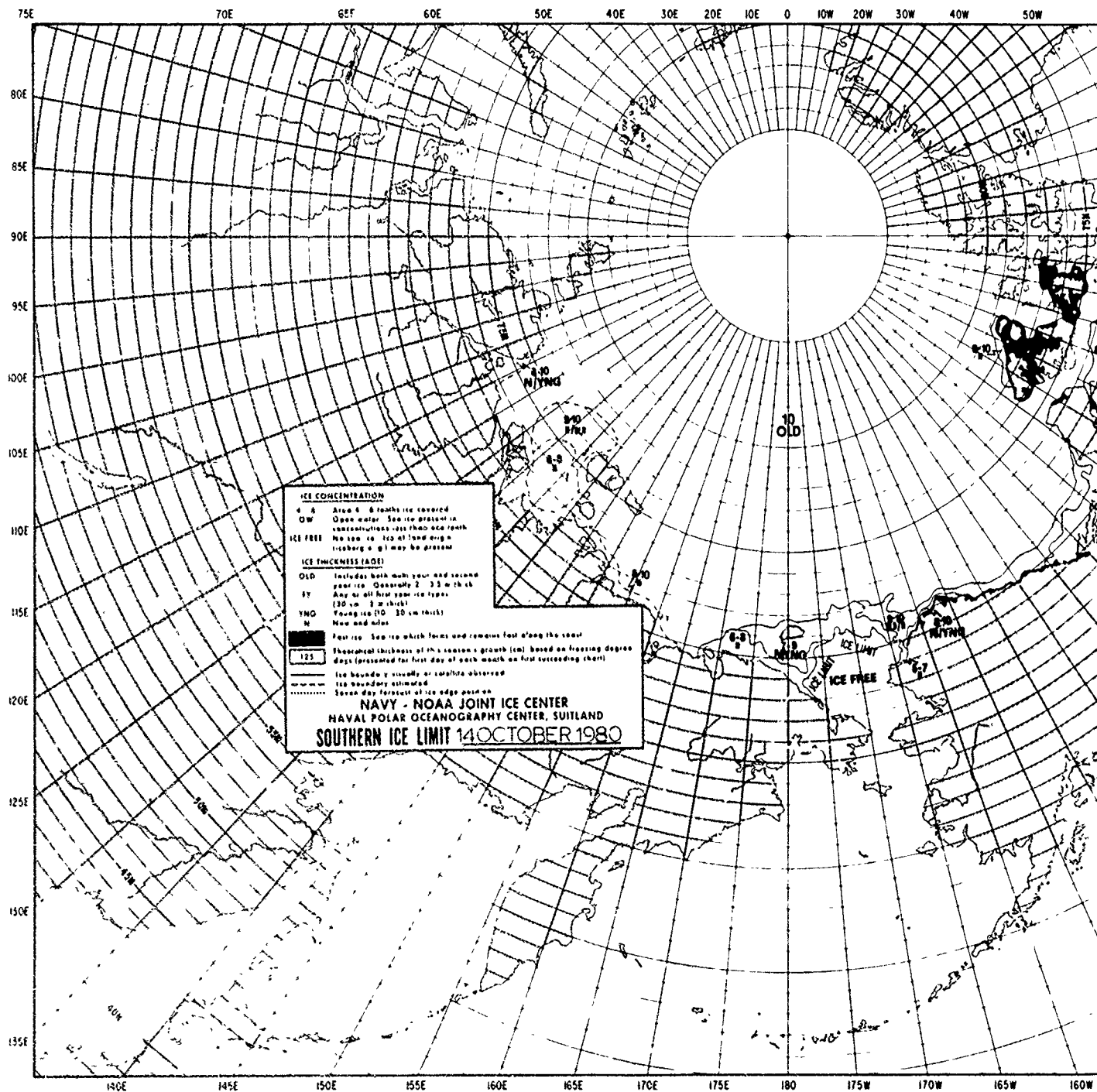






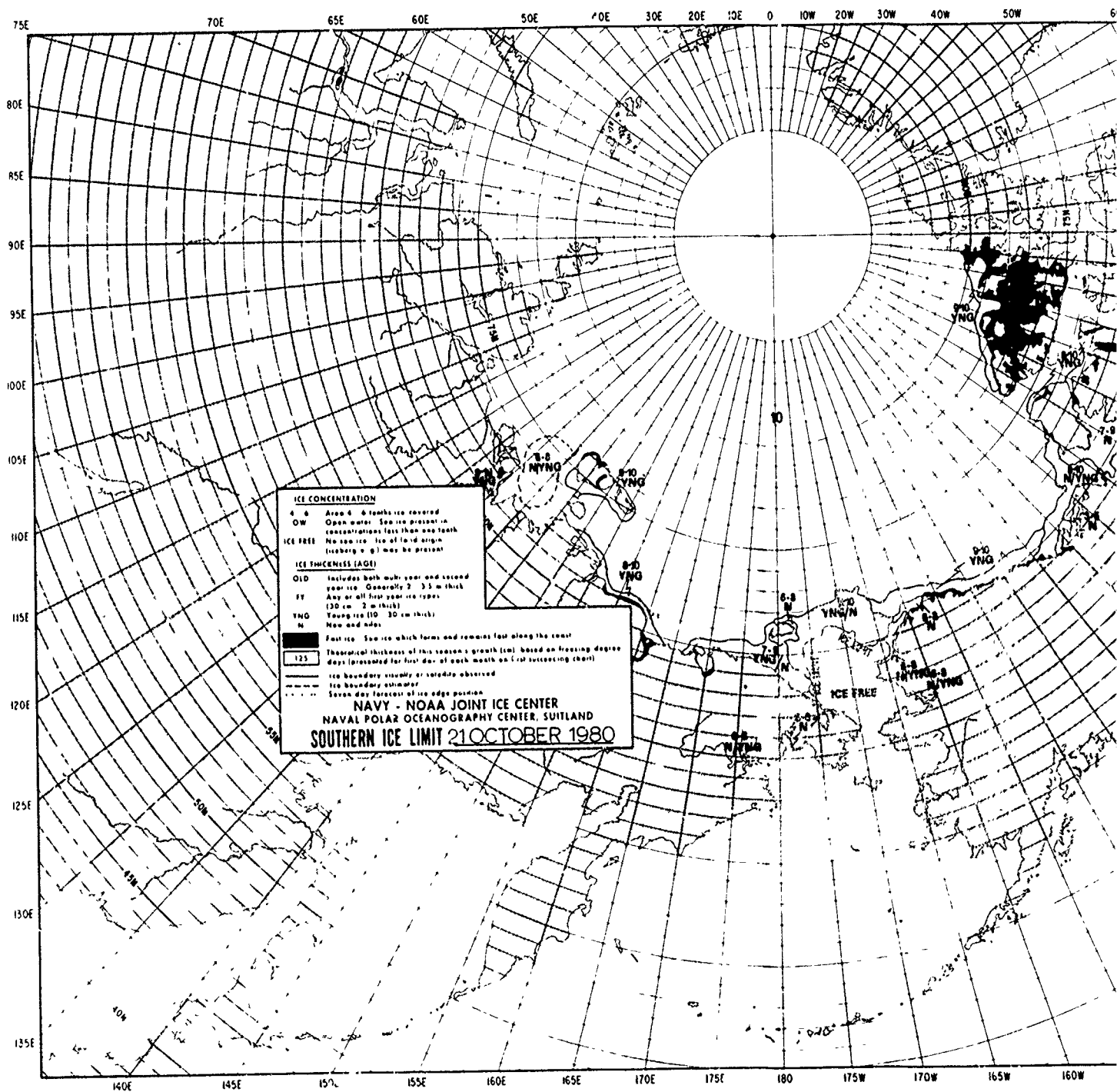


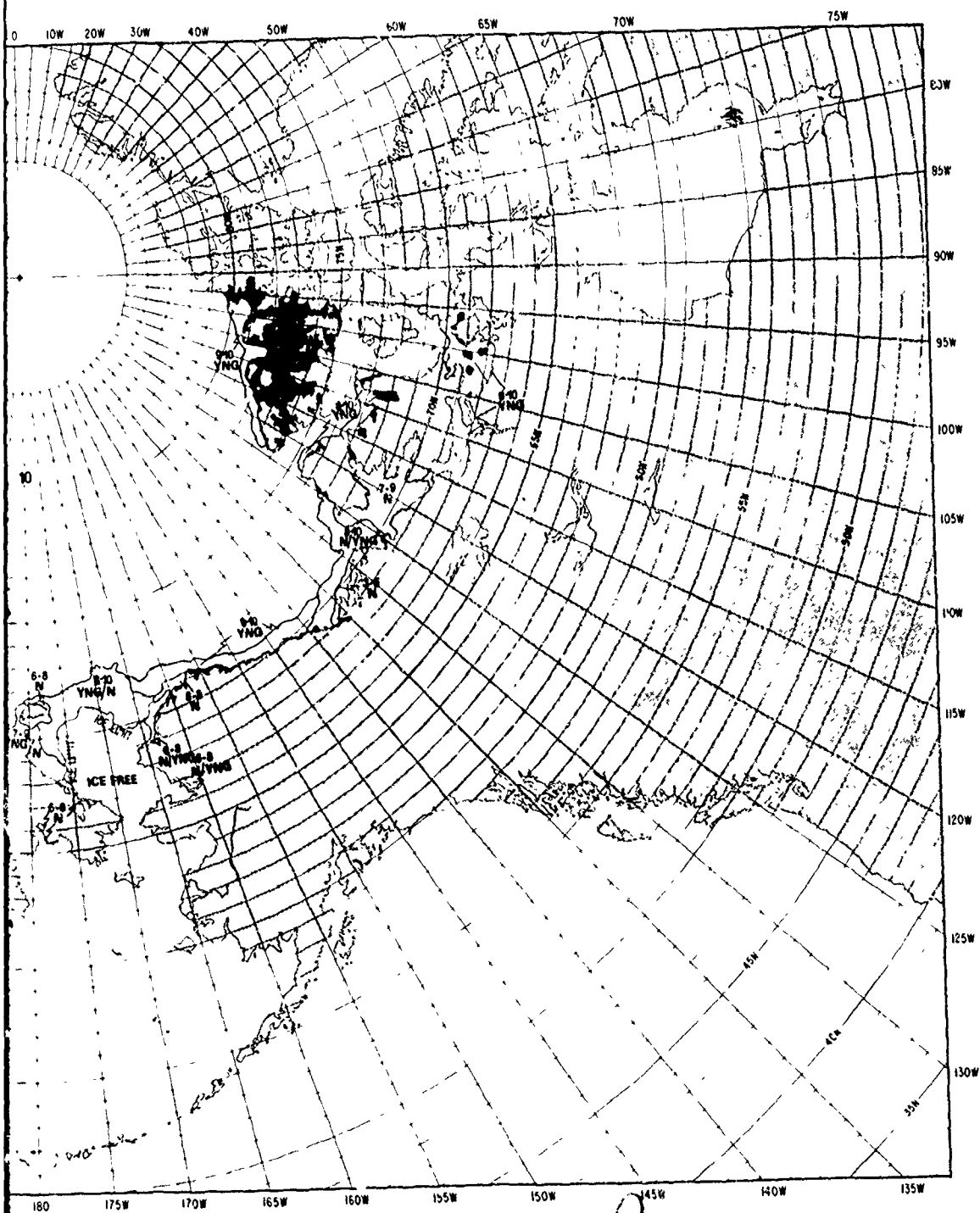


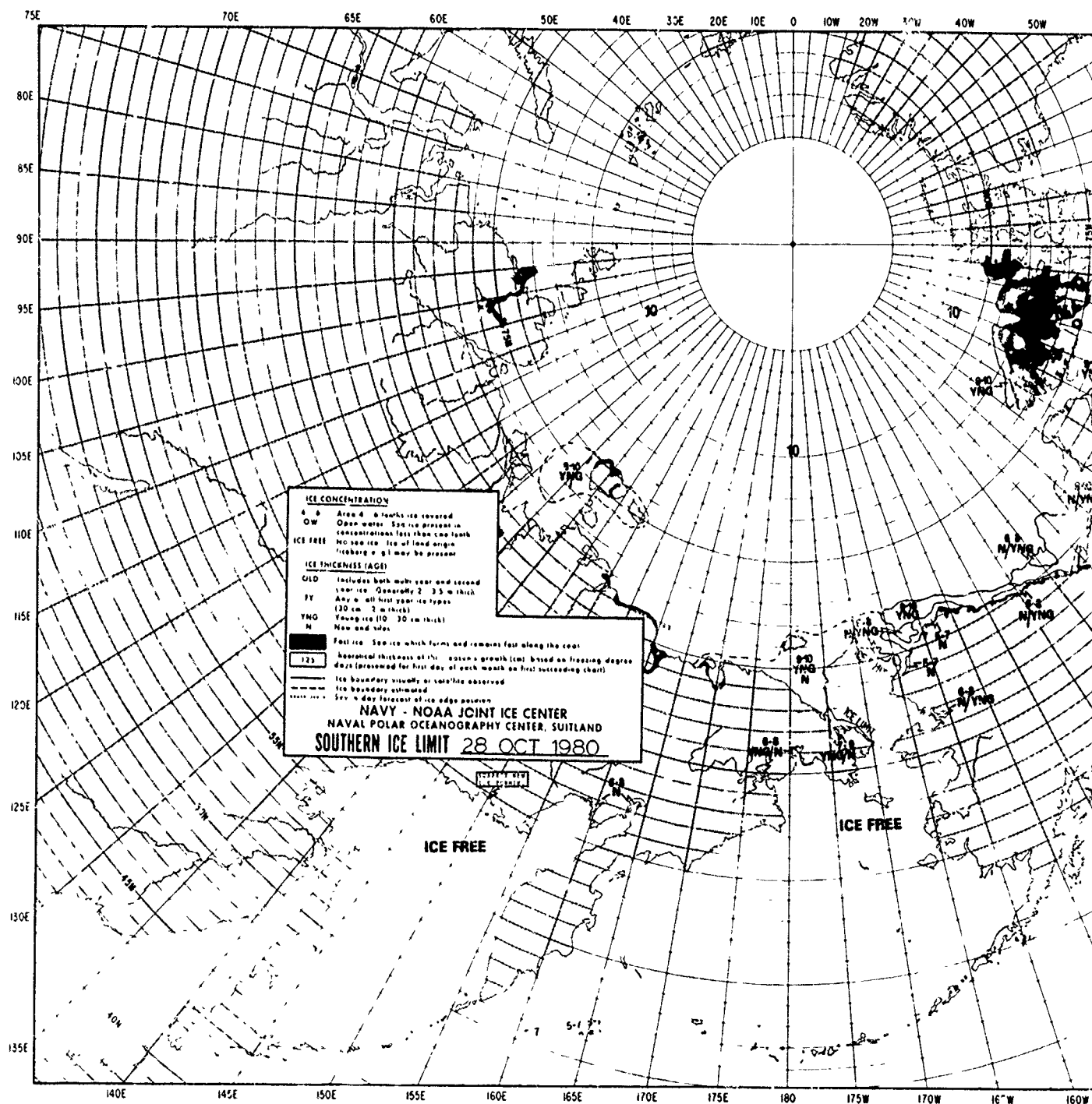


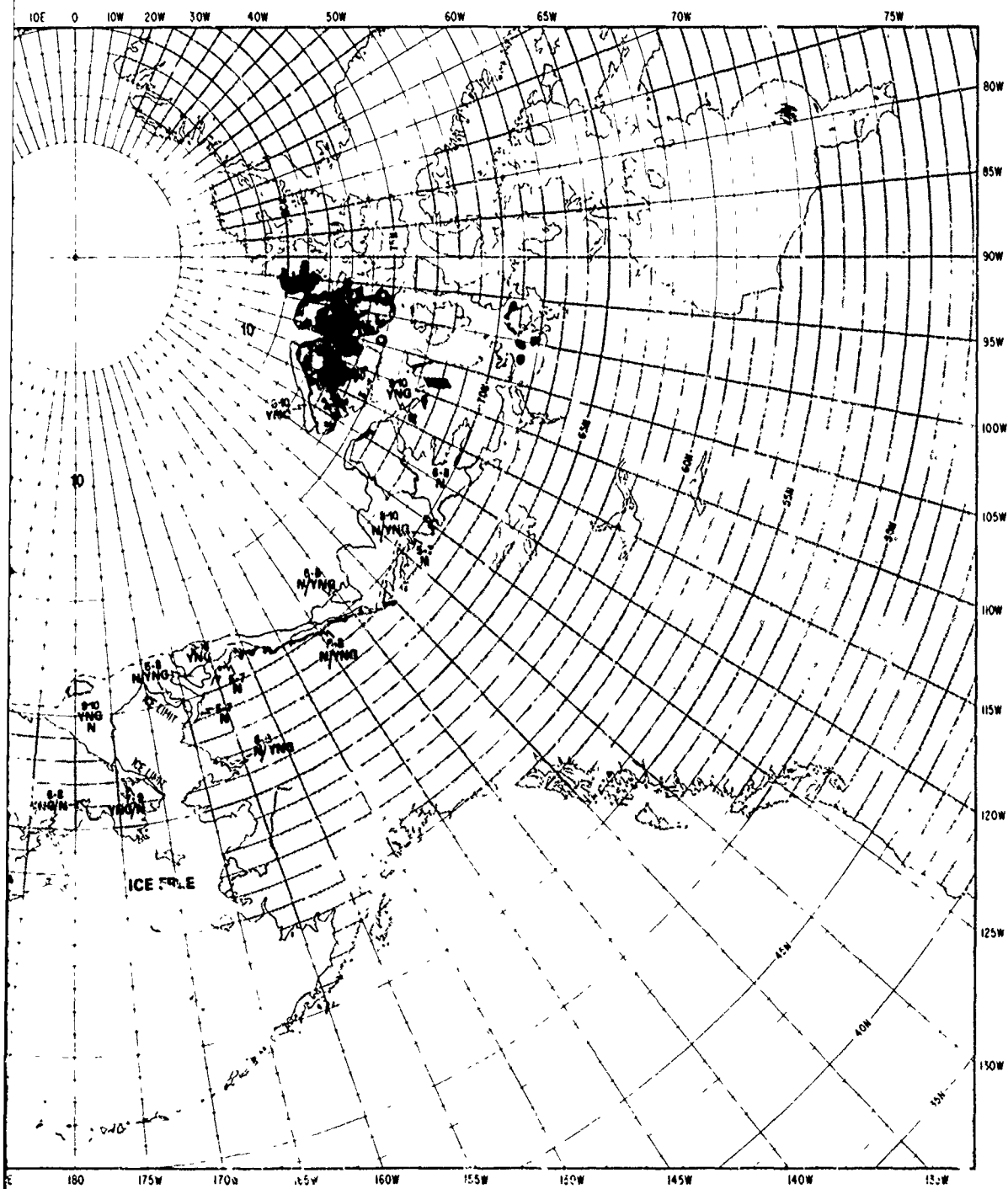




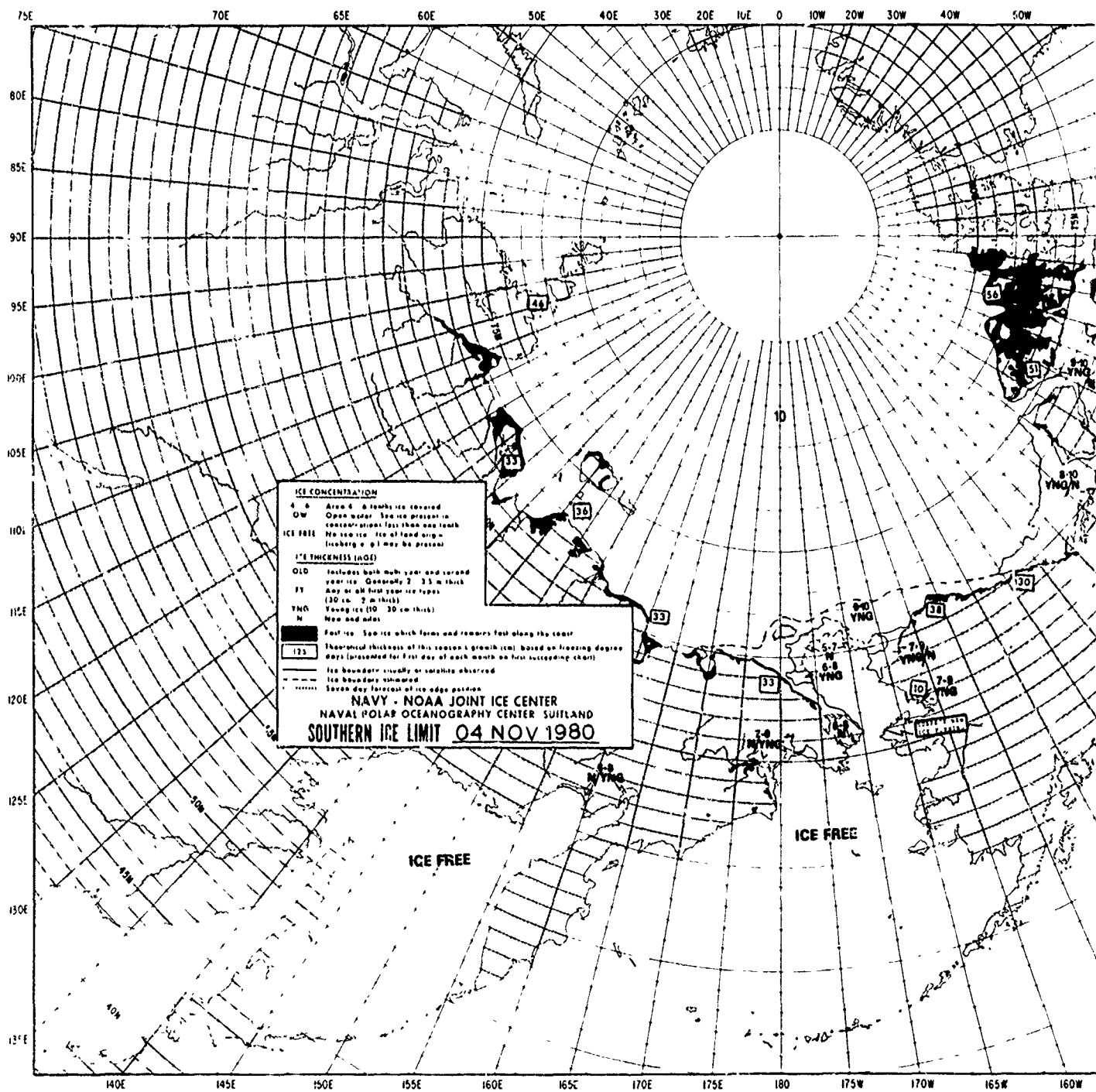


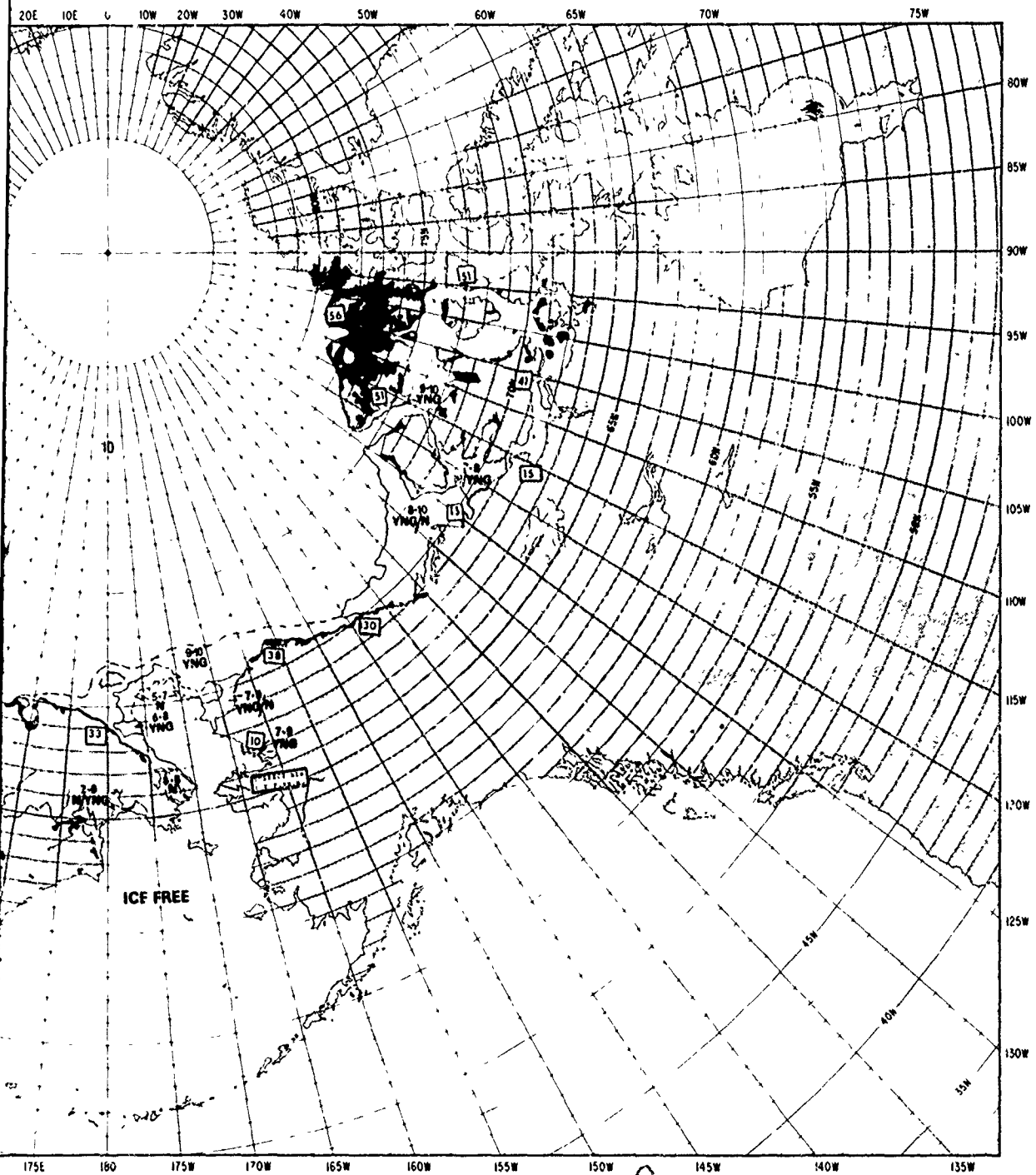




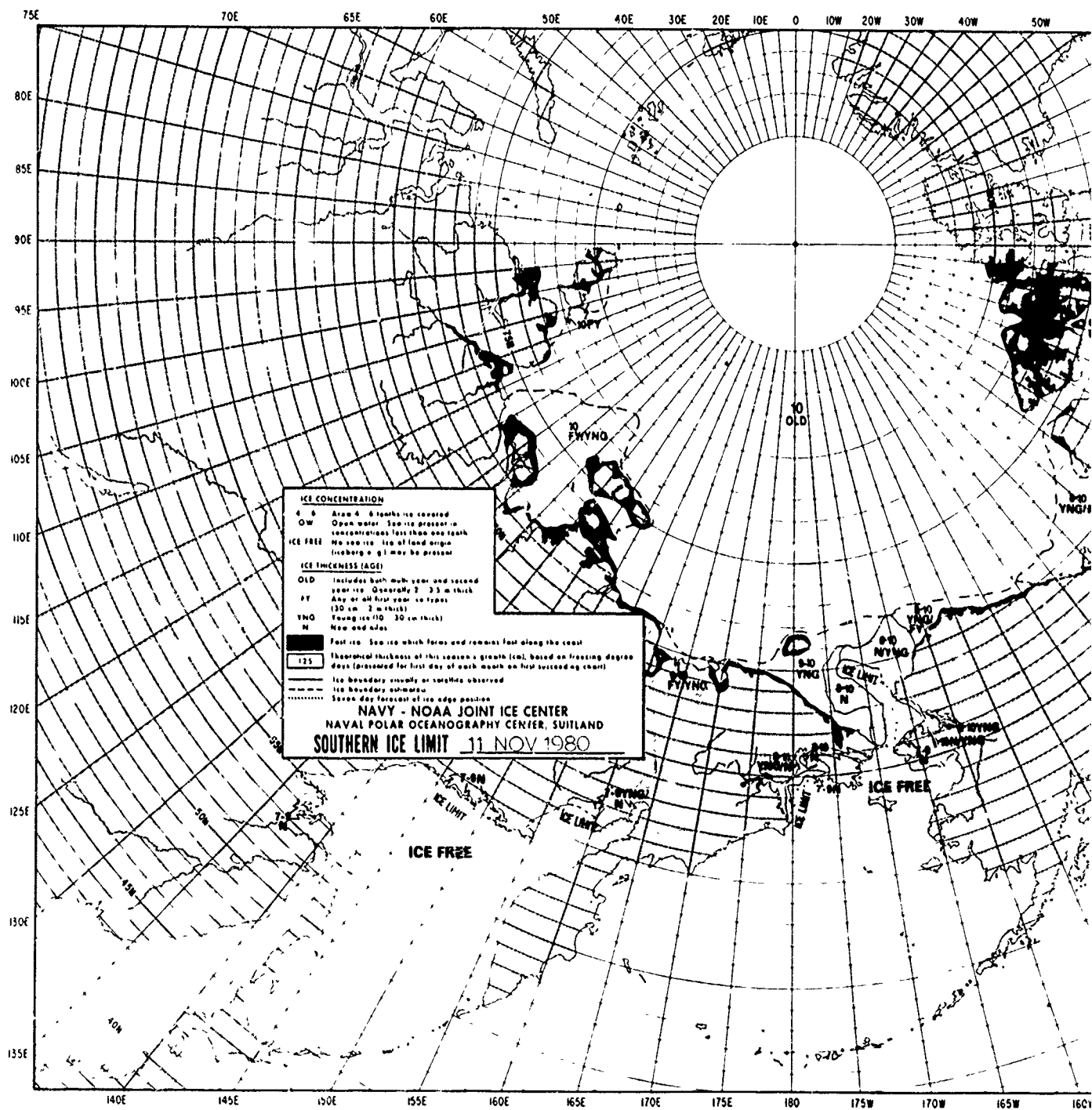


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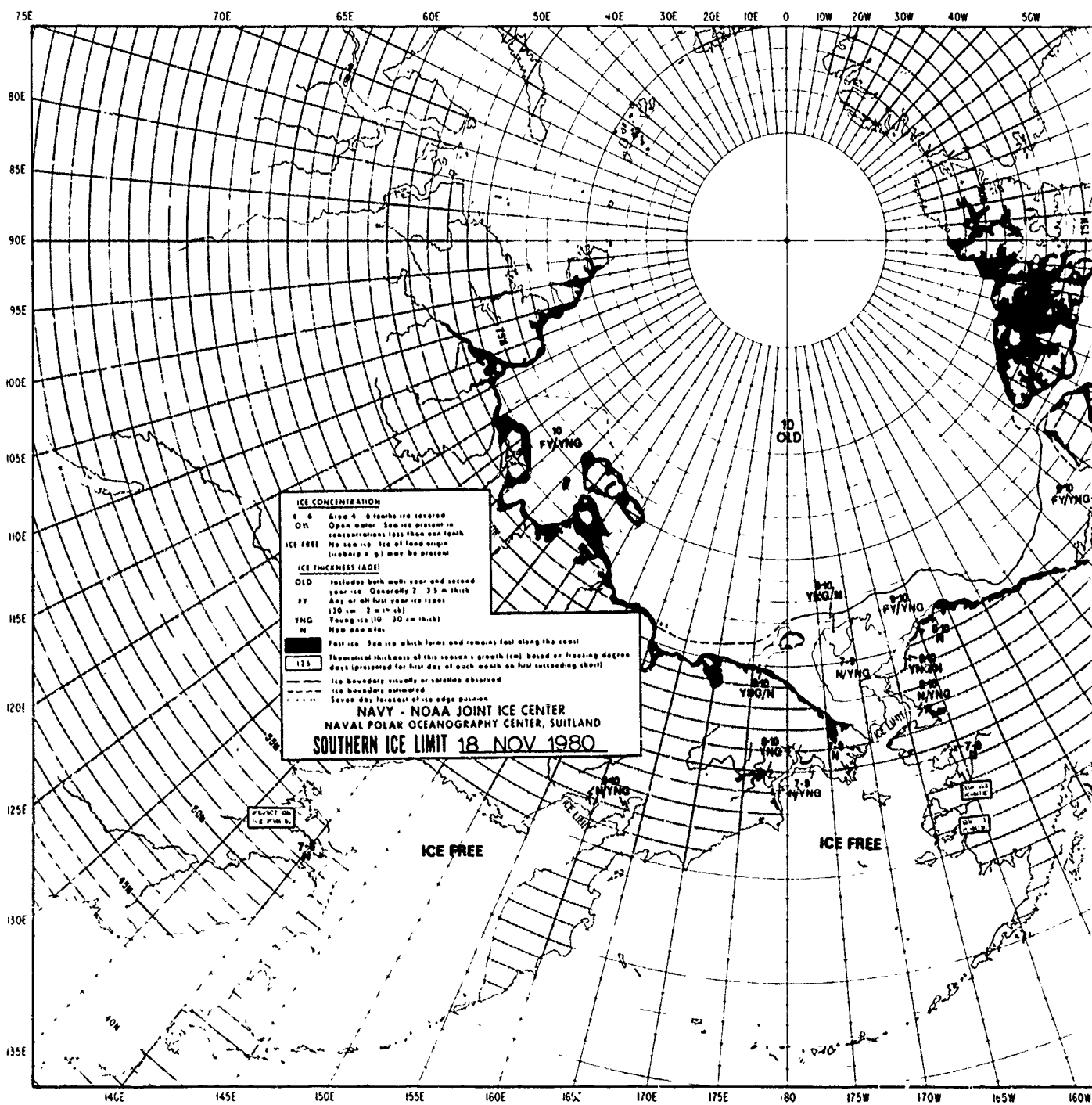


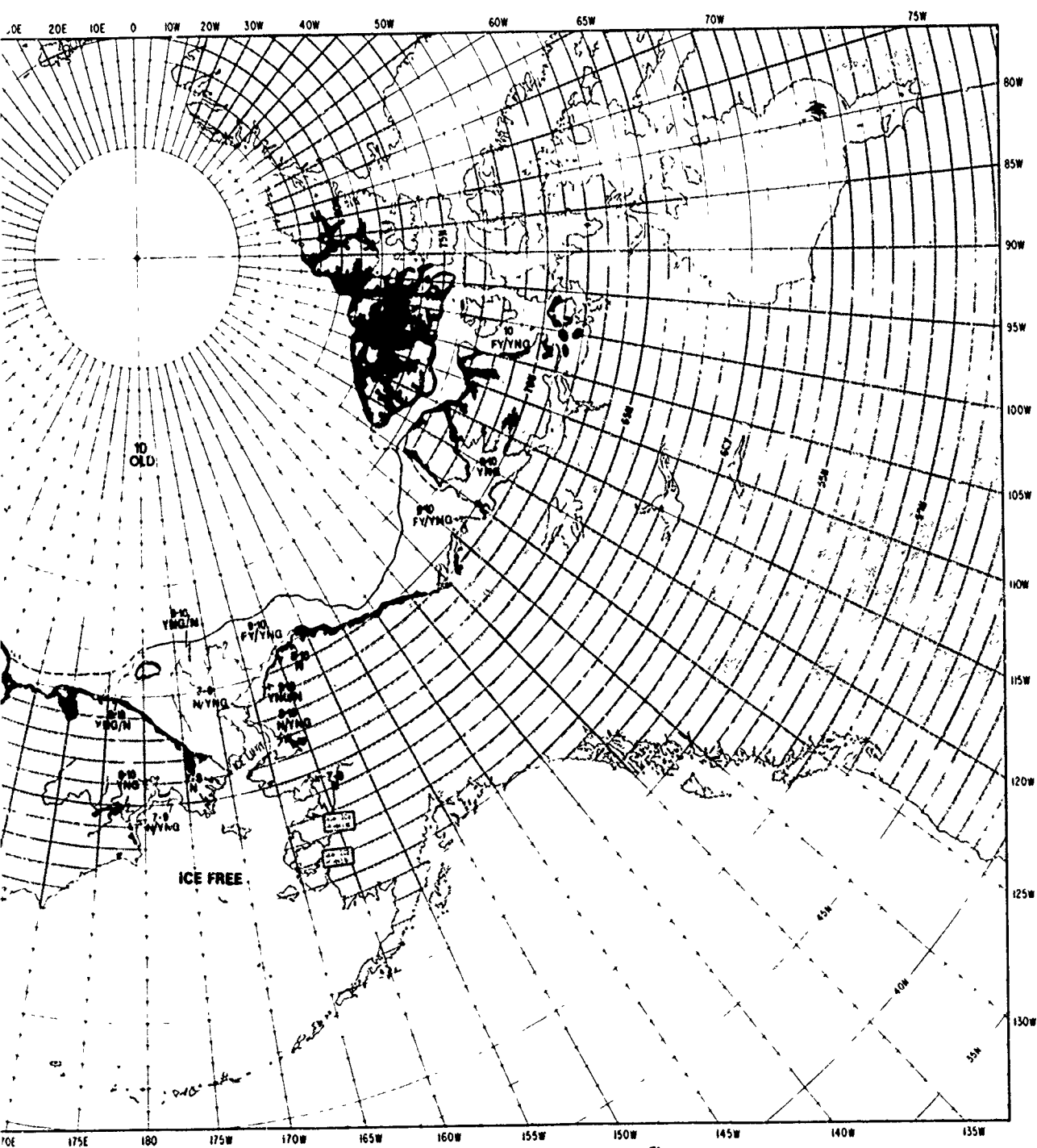
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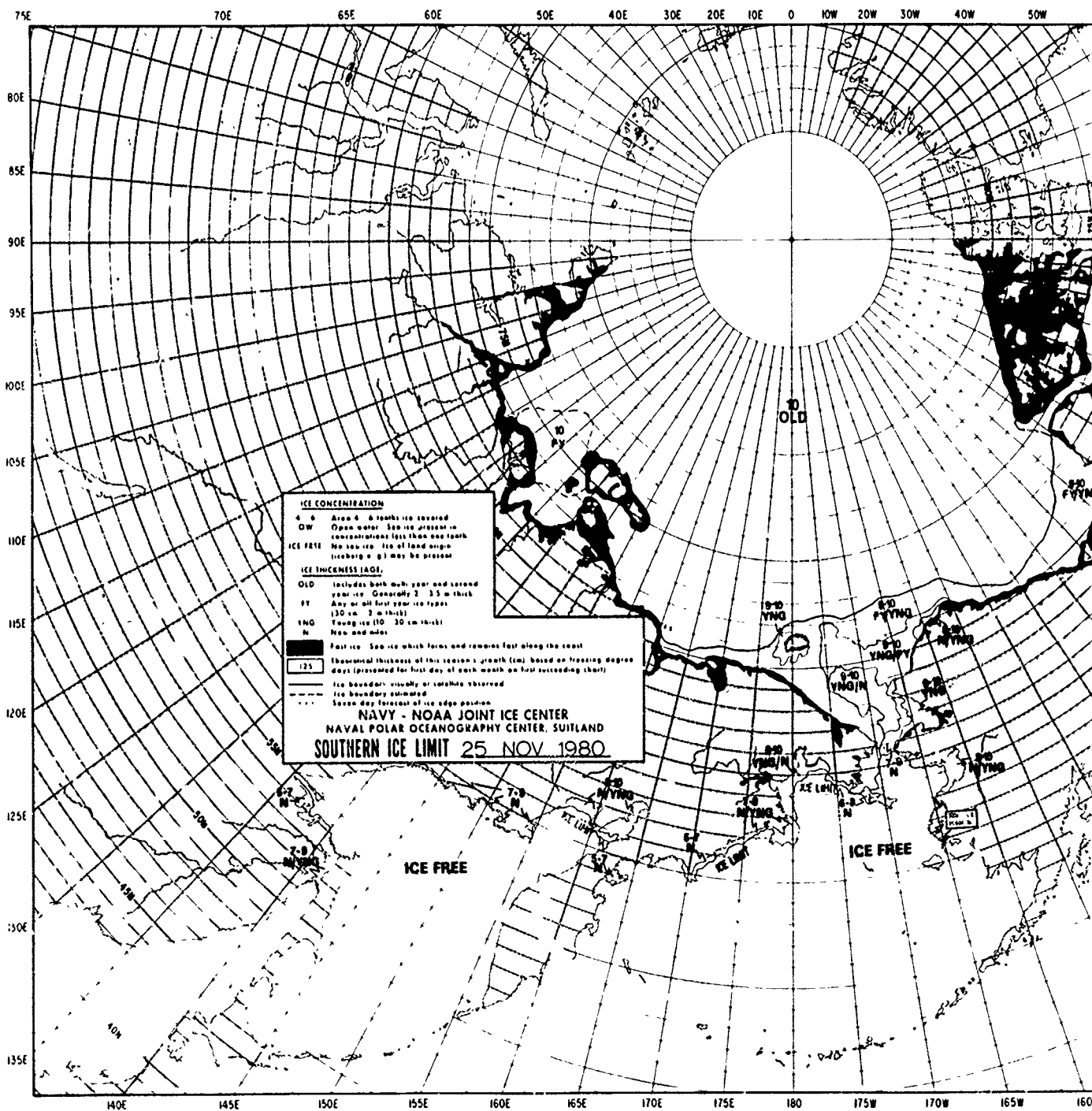


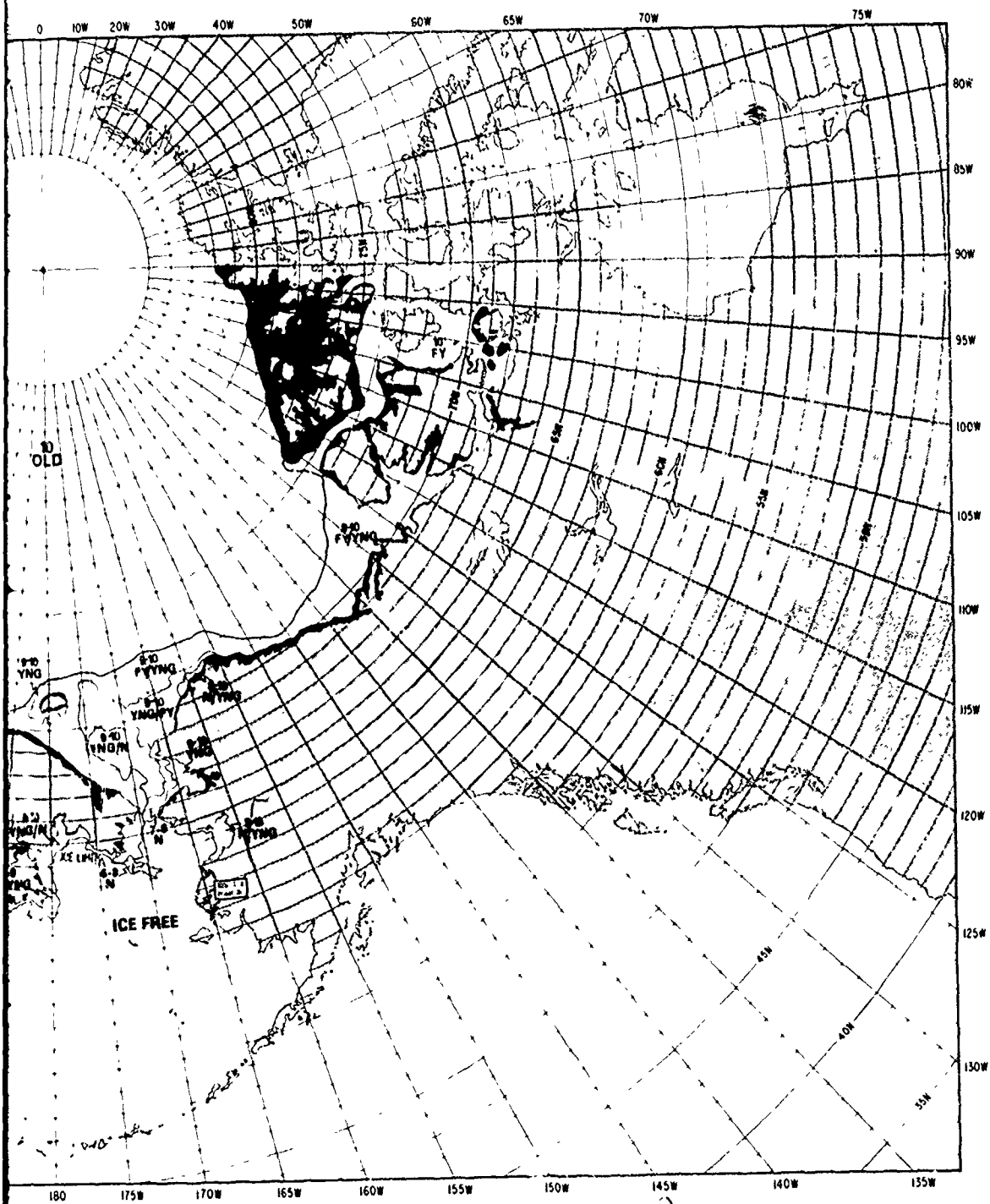




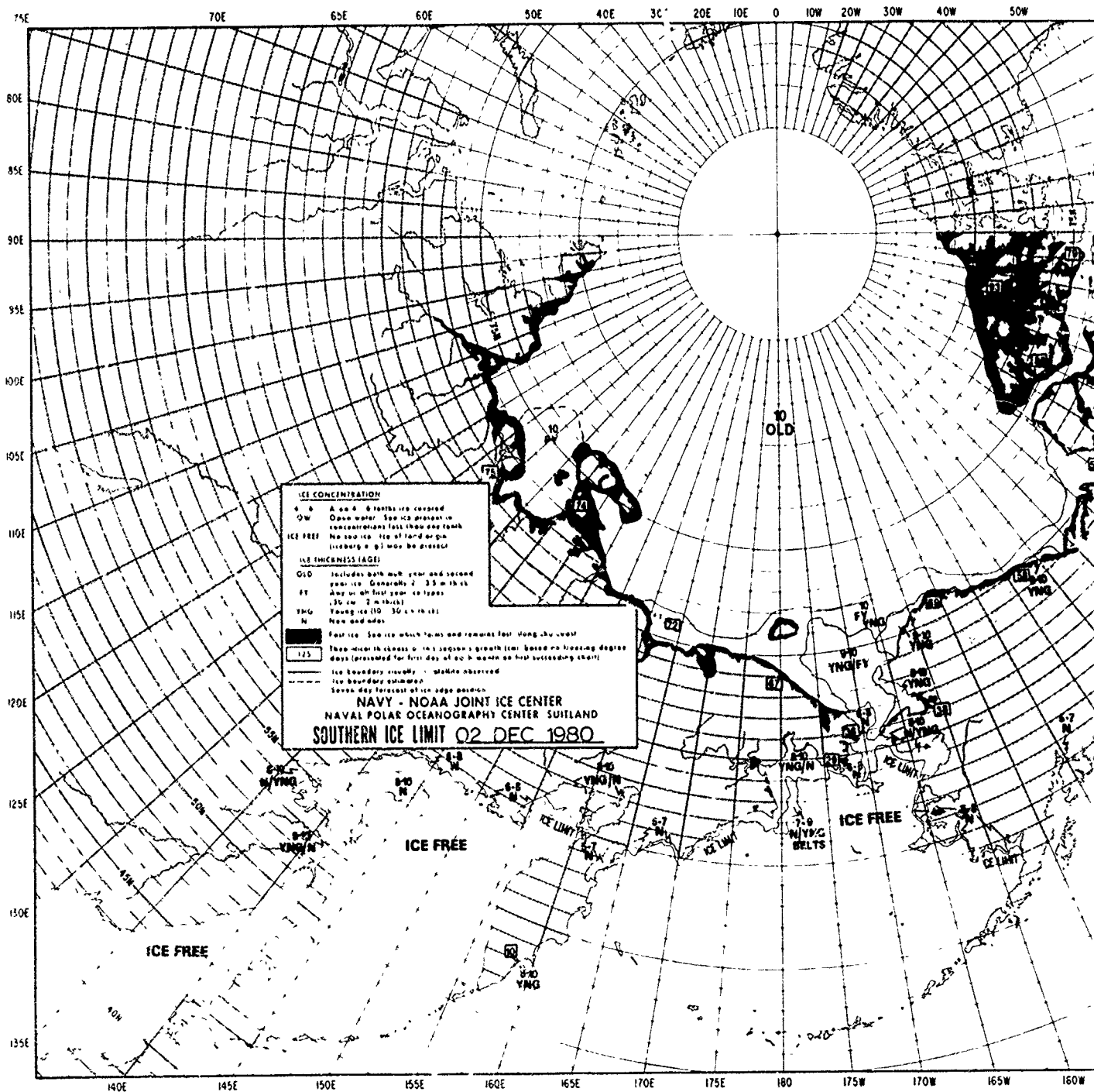


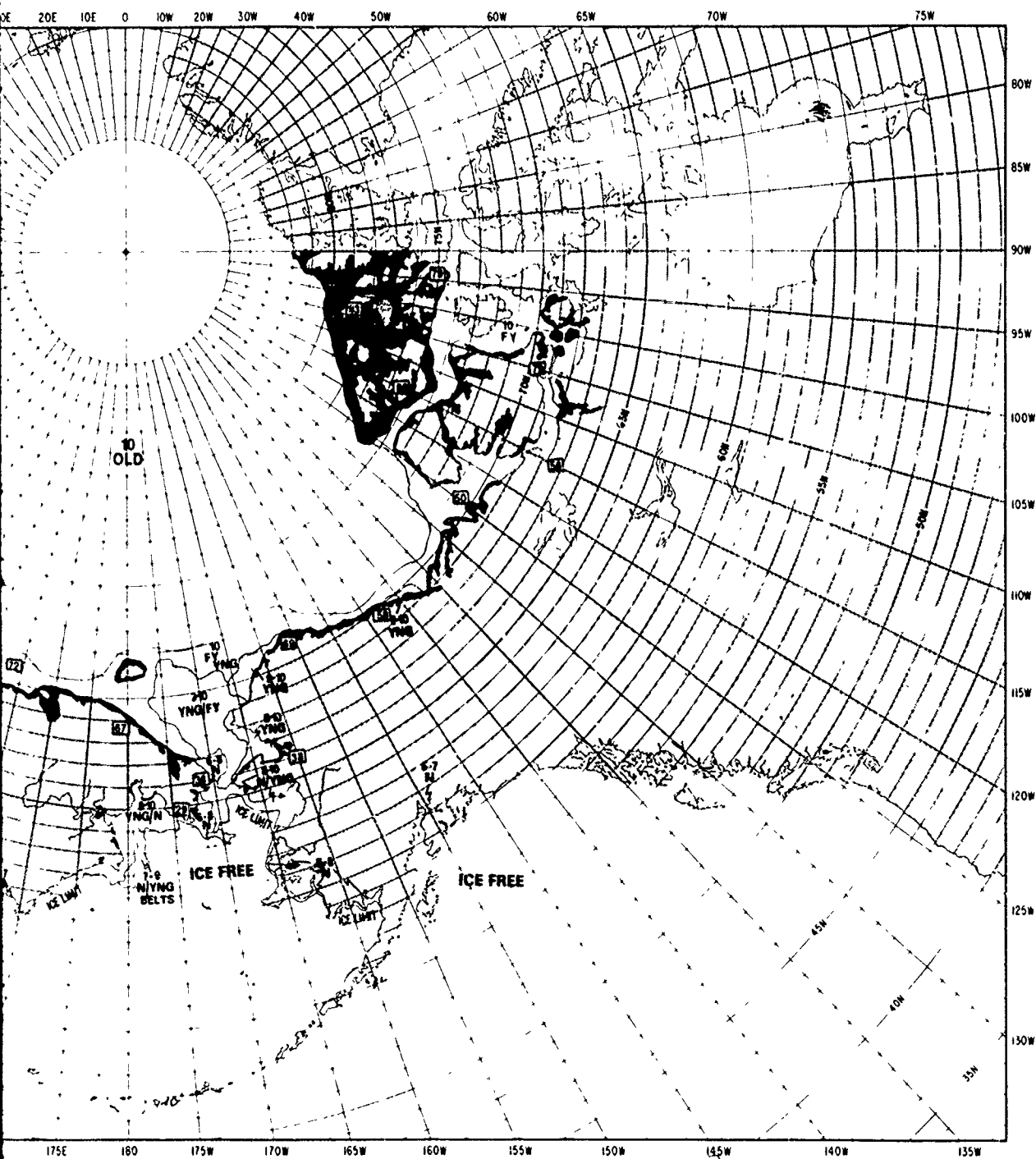
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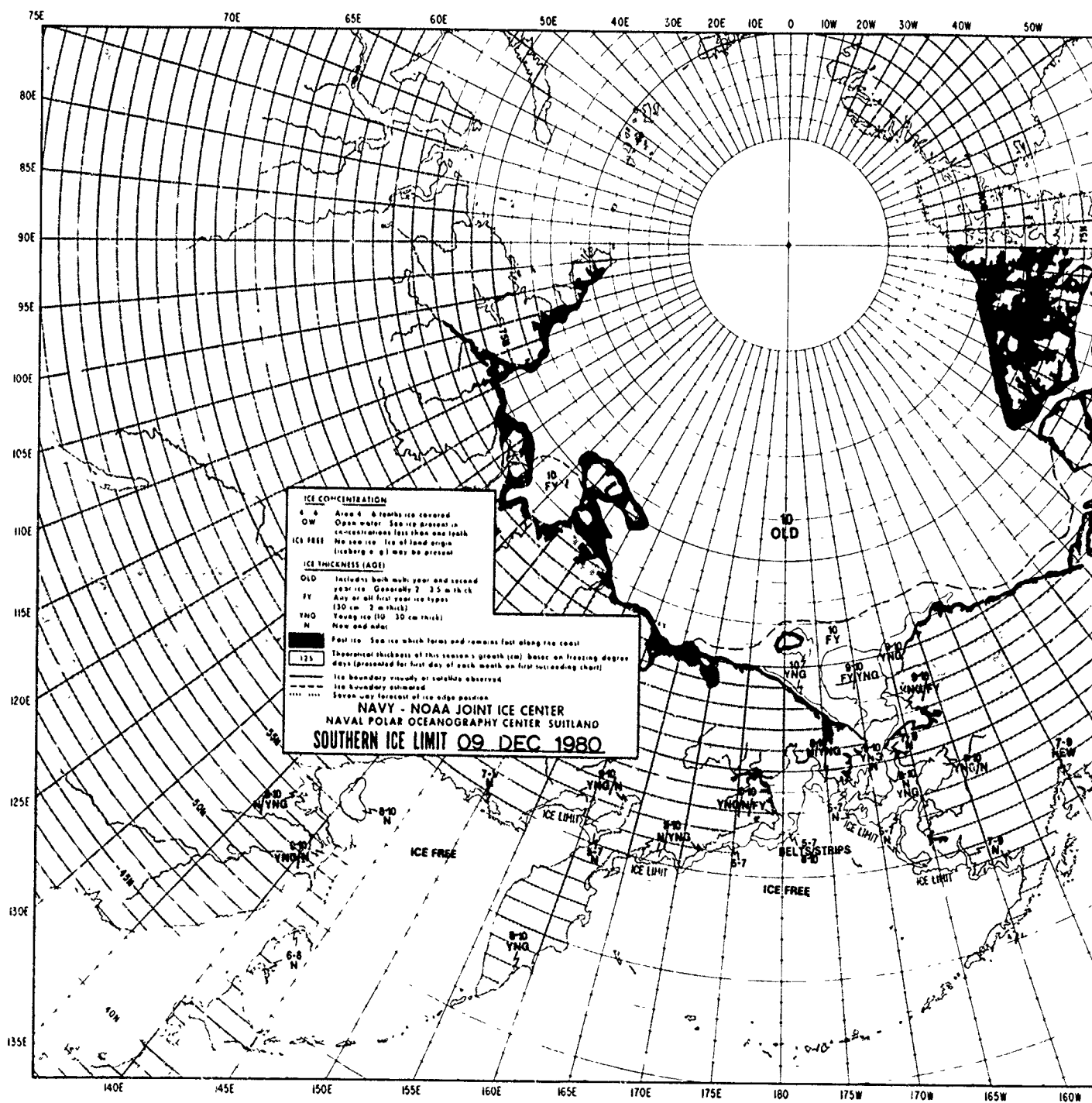




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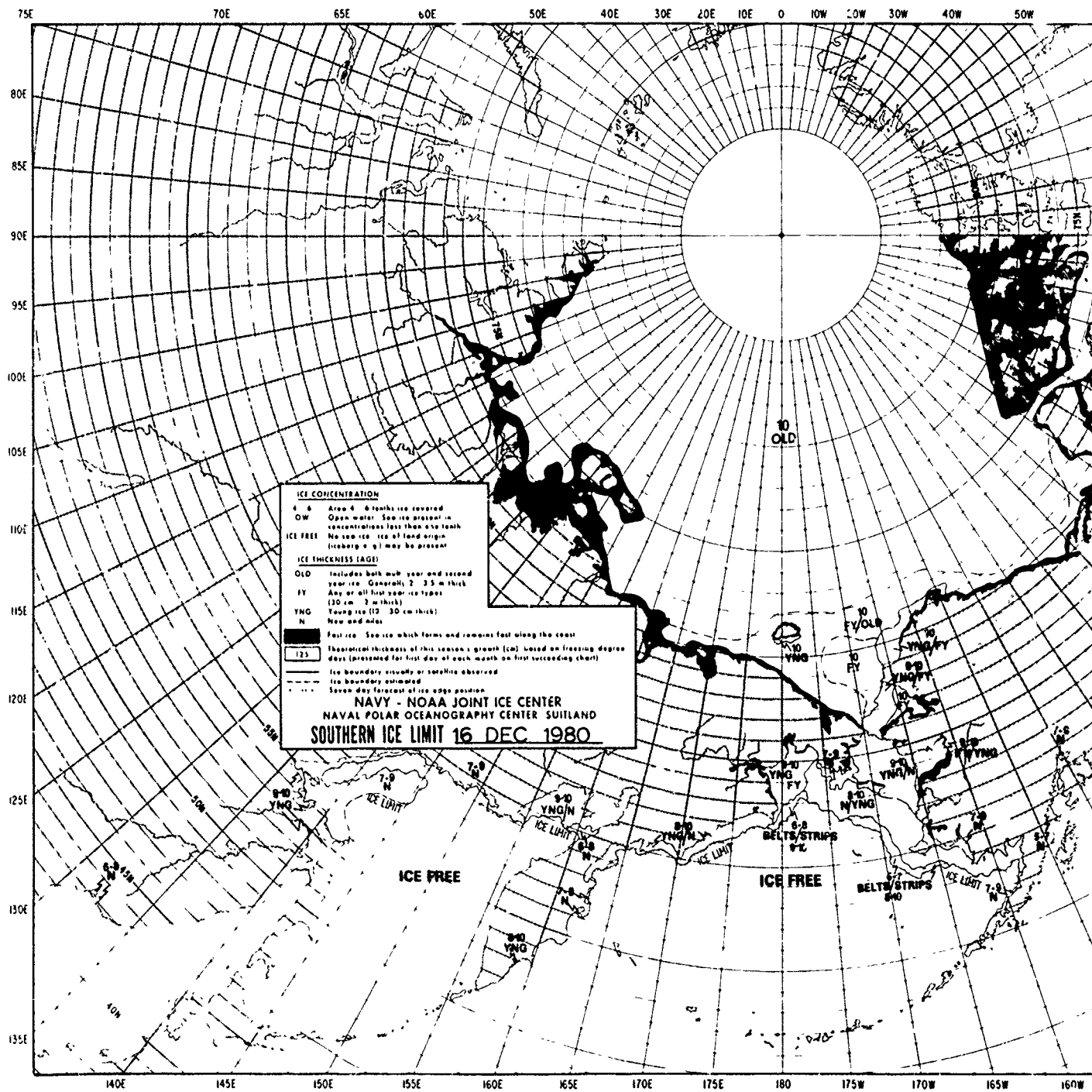




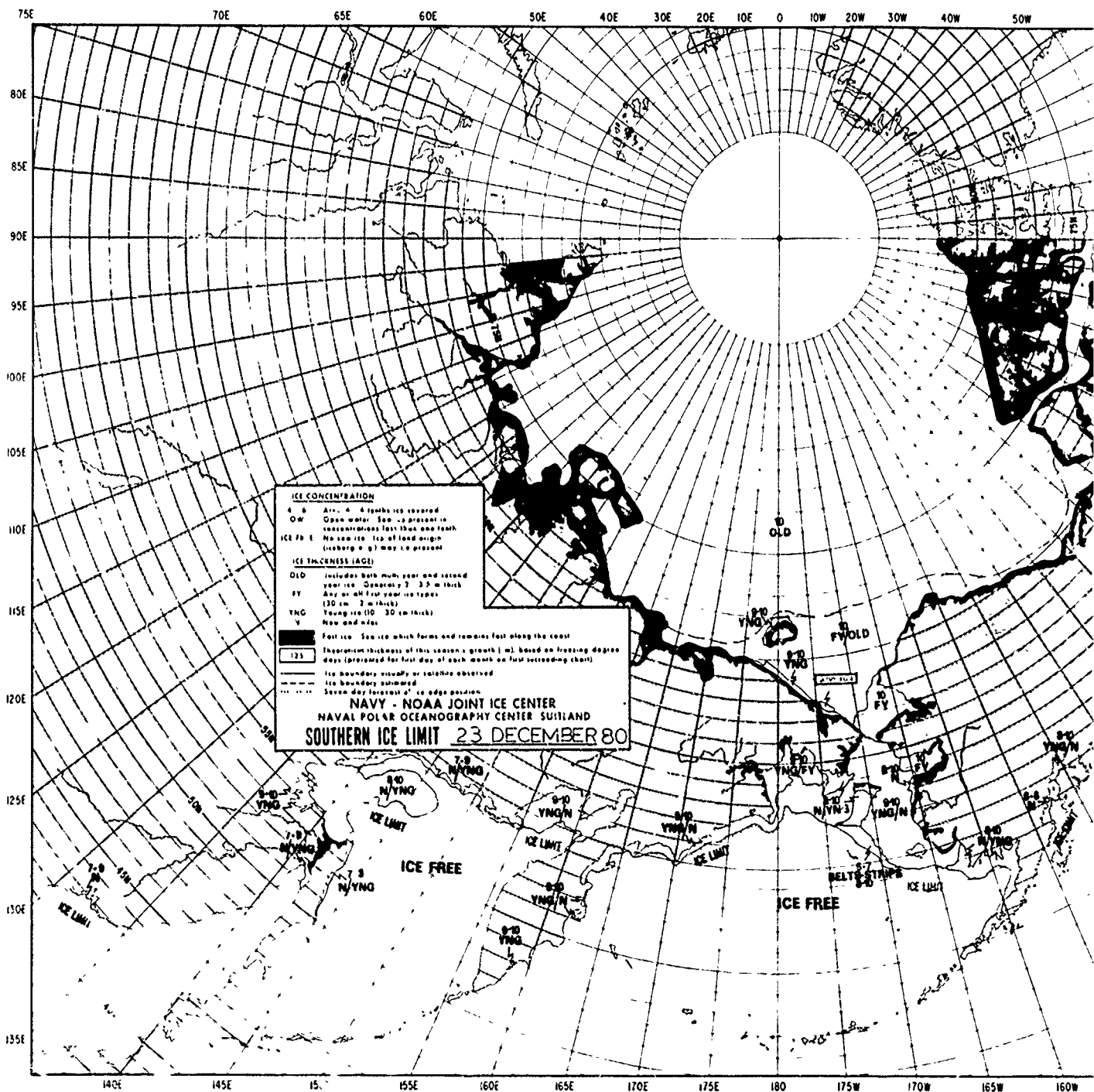














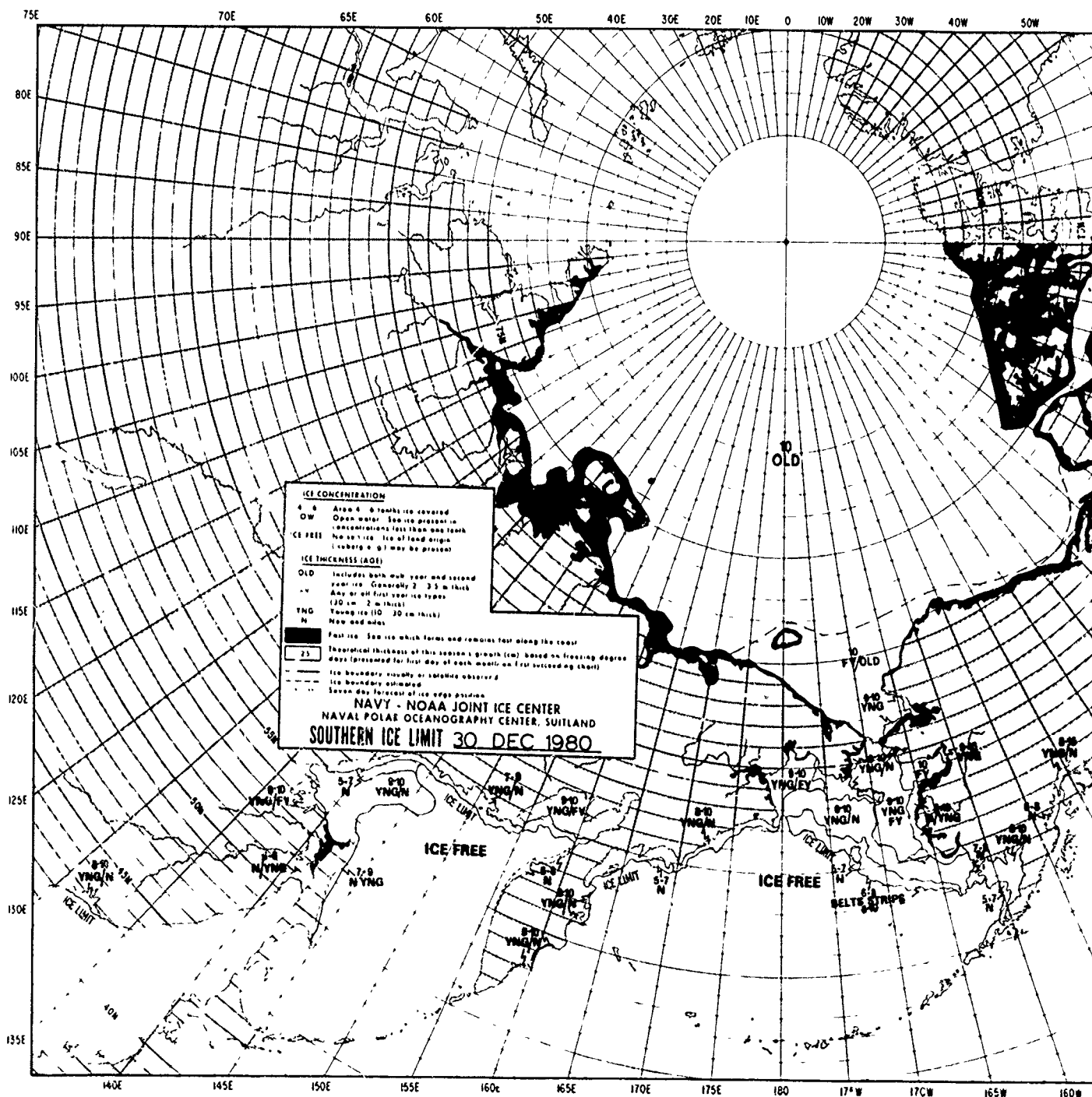




TABLE I TYPE OF SATELLITE IMAGERY UTILIZED DU

Time Period		Satellite Remote Sensing			Res
From	To	Sensor Platform	Sensor Type	Spectral Region	
1-80	11-80	TIROS-N	AVHRR HRPT/LAC VIS NIR IR	0.55-0.90um 3.55-3.93um 10.5-11.5um	
			GAC VIS IR	0.55-0.90um 10.5-11.5um	
1-80	8-80	DMSP	HR MI	0.4-1.1um 8.0-13.0um	3 4
1-80	12-80	NOAA-6	AVHRR HRPT/LAC VIS NIR IR	0.55-0.68um 3.55-3.93um 10.5-11.5um	
2-80	12-80		GAC VIS IR	0.55-0.68um 10.5-11.5um	
1-80	12-80	NIMBUS-5	ESMR	1.55cm	2
4-80	12-80	NIMBUS-7	SMMR	1.66cm	5

## Abbreviations and Acronyms

AVHRR - Advanced Very High Resolution Radiometer	km - Kilometer
cm - Centimeter	LAC - Local Area (
DMSP - Defense Meteorological Satellite Program	MI - High Resolut
ESMR - Electrically Scanning Microwave Radiometer	NIR - Near Infrare
GAC - Global Area Coverage	SMRR - Scanning Mul
HR - High Resolution (Visual Scanning Radiometer)	VHRR - Very High Re
HRPT - High Resolution Picture Transmission	VIS - Visual
IR - Infrared	um - Micrometer



VEHICLE UTILIZED DURING 1980

	Resolution	Coverage
al n		
0um 3um 5um	1km 1km 1km	Regional
0um 5um	4km 4km	Global
m um	3.7km 4.4km	Global
8um 3um 5um	1km 1km 1km	Regional
8um 5um	4km	Global
m	25km	Global
m	50km	Global

- Kilometer
- C - Local Area Coverage
- High Resolution (Infrared Scanning Radiometer)
- R - Near Infrared
- RR - Scanning Multifrequency Microwave Radiometer
- RR - Very High Resolution Radiometer
- S - Visual
- Micrometer